A COMPLETE NEW LINE OF

BLACKHAWK®

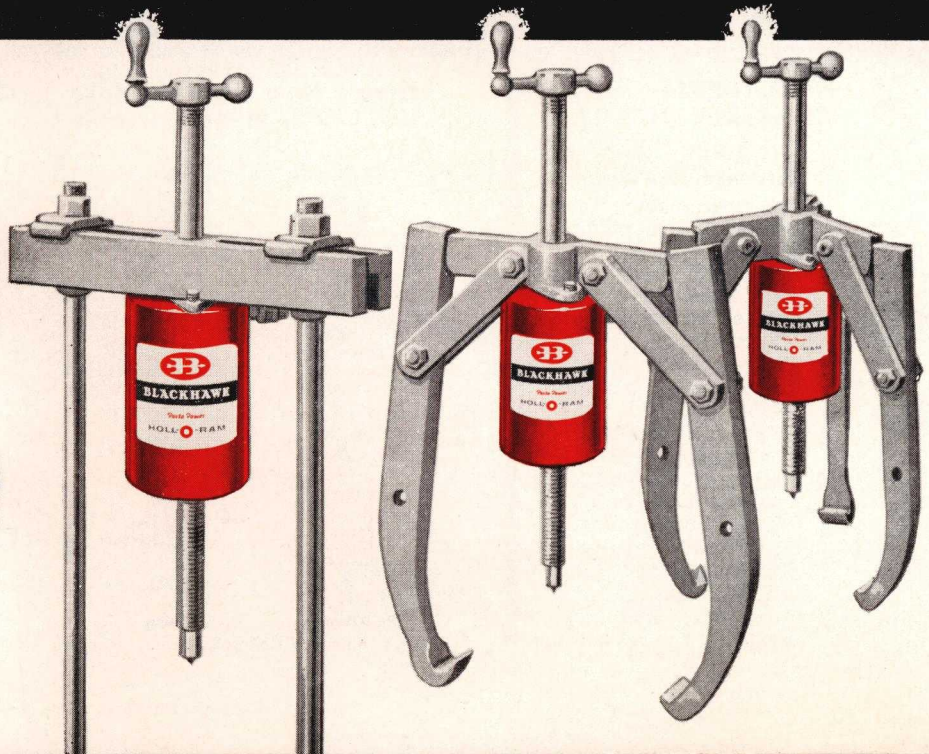
HYDRAULIC TOOLS

20 TON

30 TON

60 TON

HOLL-O-RAMS AND HYDRAULIC PULLERS



FOR CONSTRUCTION, PRODUCTION AND MAINTENANCE

Distributed By

CAT. HP-400

BLACKHAWK®

NEW HOLL-O-RAM

dynamic new multi-purpose 20, 30 and 60-ton power packages for production, maintenance, construction . . . for all industries!

Amazing Holl-O-Rams!

20-30-60-ton power packages . . . complete new family of HOLL-O-RAMS in basic tonnage capacities with unique hollow plungers! . . . to push at one end of ram—and pull through the opposite end. Applying this unique principle with such versatile attachments as interchangeable Saddles, Mounting and Adjusting Attachments and Pullers, these new HOLL-O-RAMS supply tremendous hydraulic force for 1001 jobs in maintenance, production and construction.

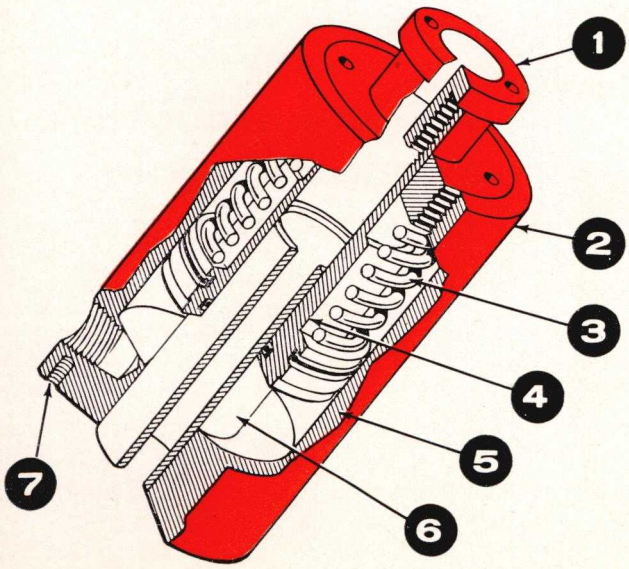
Multi-Purpose Saddles

Three saddles—key to multiple use of HOLL-O-RAM

Threaded Hollow Saddle—receives a threaded shaft such as an adjusting screw for pulling applications, press uses, or to adapt the Holl-O-Ram to production jigs and fixtures.

Smooth Hollow Saddle—used with a shaft for straight through pulling operations requiring the use of a keeper nut or the like, as in pre-stressing or post-tensioning concrete.

Solid Serrated Saddle—converts HOLL-O-RAM to a remote-controlled jack for versatile jacking application.

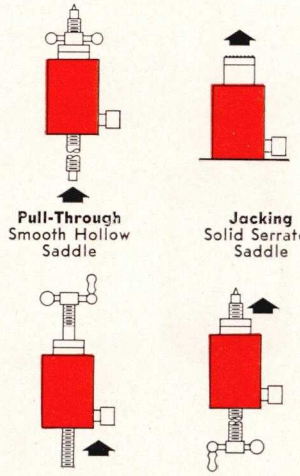


HOLL-O-RAM CONSTRUCTION . . .

cut-away "look" at internal workings

1 Interchangeable heat treated ram plunger saddles.
2 Ram body bored from solid steel stock for greater strength and longer life.
3 Fully-enclosed powerful plunger return spring.
4 Heat-treated hollow ram plunger.
5 High pressure packing prevents leakage . . . permits high-cycling.
6 Hardened plunger guide machined to a fine micro-finish.
7 Convenient base mounting tapped holes.

Here's How Saddles Make HOLL-O-RAM So Versatile



Copyright Blackhawk 1957

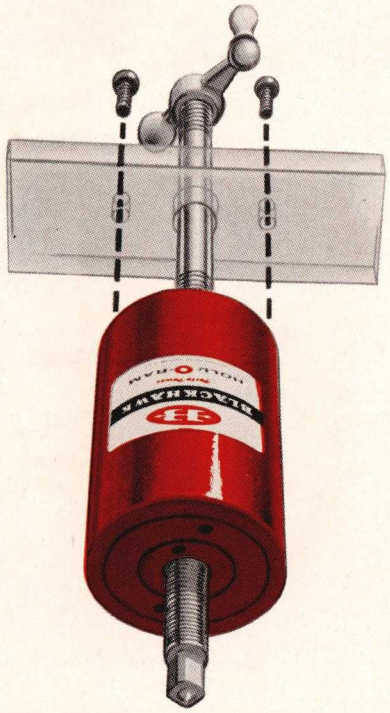
HAS UNLIMITED USES

HYDRAULIC HOLL-O-RAMS

Blackhawk Mfg. Co. is the world's **largest** producer of universally used hydraulic power tools. Blackhawk created famous Porto-Power® automotive and industrial jacks . . . complete lines of solid rams and related products. Amazing HOLL-O-RAMS are yours because of this hydraulic tool know-how . . . from experience **second to none**!

New revolutionary Blackhawk HOLL-O-RAMS and Hydraulic Pullers open tremendous new production and maintenance opportunities. Far beyond the scope of any tool on the market today, HOLL-O-RAMS used with Blackhawk Hydraulic Pump and Hose, harnesses hydraulic force for such applications as pre-stressing concrete—powering a press—actuating jigs and fixtures—lifting, as a jack, and removing or installing components of shaft driven equipment.

Hollow-Center design—quick, easy exchange of three different saddles—adjusting and mounting attachments—all are keys to sensational HOLL-O-RAM'S unmatched versatility. Used with these various attachments, the HOLL-O-RAM gives you multiple-uses not found with any other hydraulic unit. There's no waste of power stroke to position ram plunger against work and use of power stroke can be extended beyond range of ram plunger travel. What's more, versatility of one ram offers broad scope of possible hydraulic tool applications.



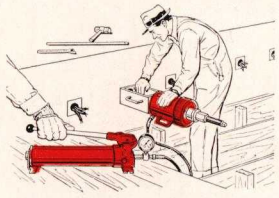
Versatile Mounting and Adjusting Attachments

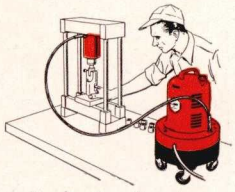
Base of all HOLL-O-RAMS are provided with tapped holes. Attaching Screws permit easy base mounting. This feature permits ready mounting of ram to attachments, fixtures, presses, and for production applications. Adjusting Screw provides a means to contact the load immediately to make full use of ram's power stroke. Extends range of power stroke beyond plunger travel.

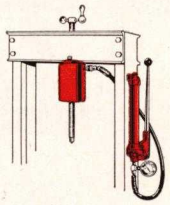
Powerhouse for Pullers

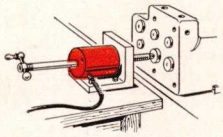
A maintenance man's dream—a standard tool to do special jobs. Powers a full line of Blackhawk pullers to meet every situation . . . from stubborn little jobs to big maintenance projects . . . with extreme ease, speed, safety! One Hydraulic Unit with pulling attachments, gives the power for **every** maintenance job—no need for extra tooling.

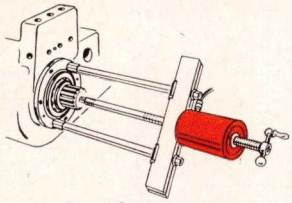
Unfolds new horizons in production, maintenance, construction

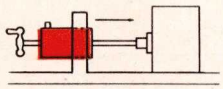

Pre-Stressing

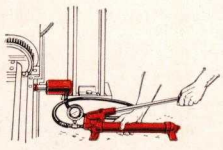

Production Pressing

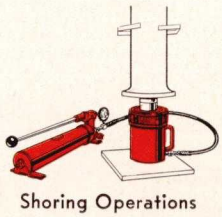

Pressing


Jigs and Fixtures

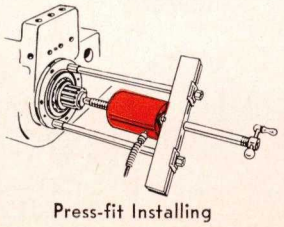

Press-fit Removing


Mechanical Movements


Versatile Jacking


Shoring Operations

Maintenance Pulling


Press-fit Installing

BLACKHAWK®

HOLL-O-RAM Hydraulic Units

key power source for jobs unlimited!

Compact, Lightweight, Low Cost . . . Works in any position . . .
Complete Remote Control "Package"

RC-20 (Ram Only)

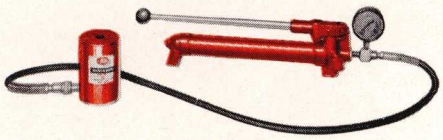
20-ton Hydraulic Unit

HP-20-G with gauge, HP-20 without gauge

For the hundreds of production, maintenance and construction jobs where controlled hydraulic power is the only practical answer.

HP-20-G contains: RC-20 Holl-O-Ram • Z-913 six-foot hose • HP-2344 Gauge Adaptor • HP-2345 Gauge • P-76 Pump.

HP-20 contains: Same as above, less Gauge and Gauge Adaptor.


HP-20-G

RC-30 (Ram Only)

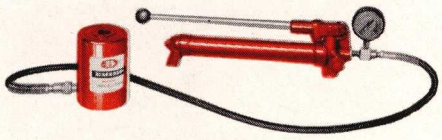
30-ton Hydraulic Unit

HP-30-G with gauge, HP-30 without gauge

This unit gives full 50% more power for those tough jobs. Has extra-wide range of applications. Works in any position for fast, safe, operation.

HP-30-G contains: RC-30 Holl-O-Ram • Z-913 six-foot hose • HP-2344 Gauge Adaptor • HP-2345 Gauge • P-76 Pump.

HP-30 contains: Same as above, less Gauge and Gauge Adaptor.


HP-30-G

RC-60 (Ram Only)

60-ton Hydraulic Unit

HP-60-G with gauge, HP-60 without gauge

Has 120,000 pounds of brute power needed for the toughest problems in all fields.

Includes **new** P-80 **automatic** two-speed pump with "Lightning Lift" feature that quickly contacts ram plunger with load. Tremendous time-saving advantage.

Pump **automatically** shifts into power stroke when load is contacted.

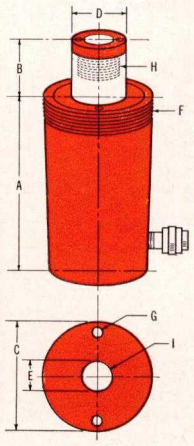
HP-60-G contains: RC-60 Holl-O-Ram • Z-913 six-foot hose • HP-2344 Gauge Adaptor • HP-2345 Gauge • P-76 Pump.

HP-60 contains: Same as above, less Gauge and Gauge Adaptor.

New 2-Speed Automatic Pump

HP-60-G

For other Holl-O-Ram models in 10-ton (RC-426) and 12-ton (RC-112) capacities, see catalog H-201.



HOLL-O-RAM SPECIFICATIONS

Machine thread information gives type, then lists: thread diameter—"threads per inch, length of thread"

Ram Model	RC-20	RC-30	RC-60
Rated Capacity	20 Ton	30 Ton	60 Ton
A—Ram Retracted	6 5/16"	7"	9 1/4"
B—Plunger Travel	2"	2 1/2"	3"
C—Ram O.D.	3 7/8"	4 1/2"	6 1/4"
D—Plunger O.D.	2"	2 1/4"	3 3/8"
E—Center Hole	1 1/16" Dia.	1 5/16" Dia.	2 1/8" Dia.
F—Ram Collar Thread (NS-2A)	—	—	6 1/4"-12, 2 3/16"
G—2 Tapped holes, 180° apart	on 3 1/4" dia. 3/8"-16, 13/16"	on 3 5/8" dia. 3/8"-16, 5/8"	on 5 1/8" dia. 1/2"-13, 5/16"
H—Plung. Saddle Thread (N-2B)	1 9/16"-16, 5/8"	1 13/16"-16, 5/8"	2 7/8"-12, 1 1/16"
Plunger Retraction	Internal Spring		
Effec. Plung. Area	4.7247 sq. in.	7.216 sq. in.	13.695 sq. in.
Oil Cap.	10 cu. in.	18.5 cu. in.	41.5 cu. in.
Develops Capacity	8475 psi	8320 psi	8800 psi
Weight, approx.	16 lbs.	25 lbs.	57 lbs.
I—Oil Inlet Port	3/8"-18 N.P.T.		
Use with hose	Z-913 (Spee-D-Coupler, male half)		
Oper. by Pump	P-76 P-80, P-182	P-76 P-80, P-182	P-80, P-182

Smooth Hollow Saddles are furnished as standard with each Holl-O-Ram.

P-182 Electric Pump

Fast, effortless, fingertip-controlled electric hydraulic pump can be used with *any* HOLL-O-RAM. Four FZ-1631 casters available for use with this pump.

PUMP SPECIFICATIONS

Pump Model	P-76	P-80	P-182
How Operated	Hand	Hand automatic, two speed	Electric* Power
Oil Capacity	43 cu. in.	140 cu. in.	231 cu. in.
Pressure Rating	10,000 p.s.i.	10,000 p.s.i.	10,000 p.s.i. Intermittent 5,000 p.s.i Continuous
Speed and Delivery cu. in. per min.	Assume 60 strokes/min.		@ 1725 rpm
	9.57	fast 31.11 power 9.02	(actual) 26.8
Outlet Port	3/8"-18 N.P.T.		
Overall Lgth.	20 1/8"	23 3/4"	12 3/4" base dia.
Overall Hght.	5 1/16"	6 7/8"	16", 18 1/2" with Casters
Handle Lgth.	18 3/4"		←
Weight	16 lbs.	26 lbs.	84 lbs.

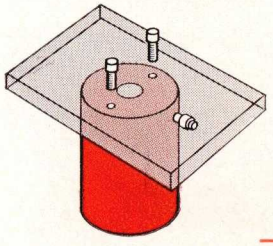
* 1/2 H.P. MOTOR: High torque—repulsion start—induction run; 115V A.C., 60 Cycle, Single Phase; 230V A.C. by changing motor leads.

attachments for mounting and adjusting

key to HOLL-O-RAM versatility!

Three interchangeable Saddles, and Mounting and Adjusting Attachments provide HOLL-O-RAM with its unique flexibility. These interchangeable saddles are the working "hearts" of HOLL-O-RAM adaptability—made to receive shafts for quick, perfectly adjustable load contact, or to convert HOLL-O-RAM into a remote control jack. The Adjusting Screw gives HOLL-O-RAM extreme adjustability for contacting load before extending power stroke in push or pull-through applications—permitting full power stroke in every operation! Ram Base Attaching Screws provide easy base mounting. Threaded Hollow Saddle, Adjusting Screw, Speed Crank and Ram Base Attaching Screws are available in complete sets. (See below.) Speed Nut used with smooth Hollow Saddle for pull-through applications of Adjusting Screw.

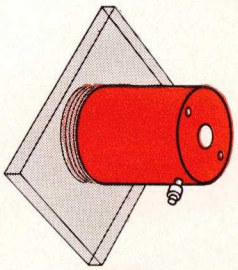
EASILY MOUNTED



At the Base
With Attaching Screws

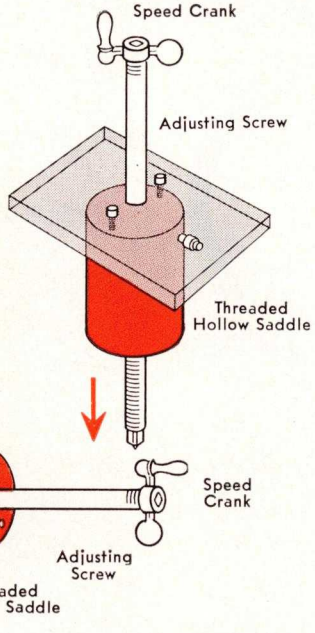
Recommended Thread Sizes for Holl-O-Rams furnished without Collar threads

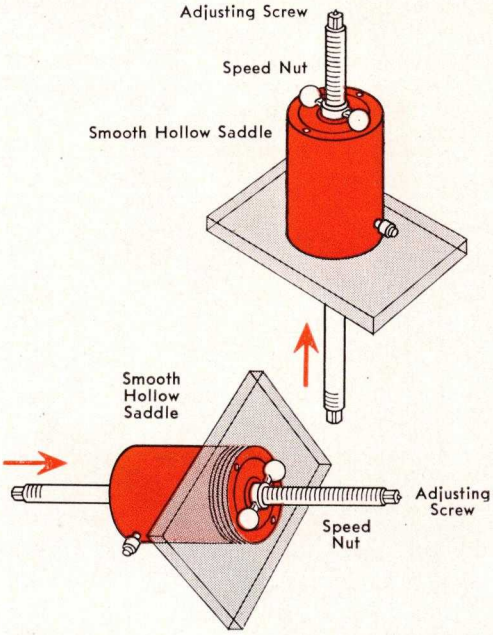
RC-20	3⅞"-16 (N-2A) 1¼" long
RC-30	4½"-12 (UN-3A), 1½" long



At the Collar
With Collar Threads

QUICKLY ADJUSTED





HOLLOW RAM PLUNGER SADDLE SPECIFICATIONS

Saddles for		RC-20	RC-30	RC-60
Smooth Hollow Saddle	Part Number	HP-2034	HP-3043	HP-5031
	Collar Diameter	2"	2¼"	3⅜"
	Shank Thread (N-2A)	1 9/16"-16, 17/32"	1 13/16"-16, 17/32"	2⅞"-12, 9/16"
	Inside Diameter	1 1/16"	1 5/16"	2⅛"
	Length	1"	1"	1 3/16"
	Spanner Wrench Holes (2)	on 1½" dia.	on 1¾" dia.	on 2¾" dia.
		¼" dia., 5/32" deep		
Serrated Solid Saddle	Part Number	HP-2026	HP-3026	HP-5026
	Collar Diameter	2"	2¼"	3⅜"
	Shank Thread (N-2A)	1 9/16"-16, 17/32"	1 13/16"-16, 17/32"	2⅞"-12, 9/16"
	Solid Saddle, Face	Fully Serrated	Fully Serrated	Serrated Quadrants
	Length	1"	1"	1 3/16"
	Spanner Wrench Holes (2)	on 1½" dia.	on 1¾" dia.	on 2¾" dia.
Threaded Hollow Saddle	Part Number	HP-2014	HP-3014	HP-5014
	Collar Diameter	2"	2¼"	3⅜"
	Shank Thread (N-2A)	1 9/16"-16, 17/32"	1 13/16"-16, 17/32"	2⅞"-12, 9/16"
	Inside Thread (UNC-2B) (NS-2B)	1"-8, 1"	1¼"-7, 1"	1⅝"-5½, 1 3/16"
	Length	1"	1"	1 3/16"
	Spanner Wrench Holes (2)	on 1½" dia.	on 1¾" dia.	on 2¾" dia.
		¼" dia., 5/32" deep		
	Allen Hd., Cup Pt., Set Screws (2)	6-40, ¼"	8-36, ¼"	8-36, ⅜"

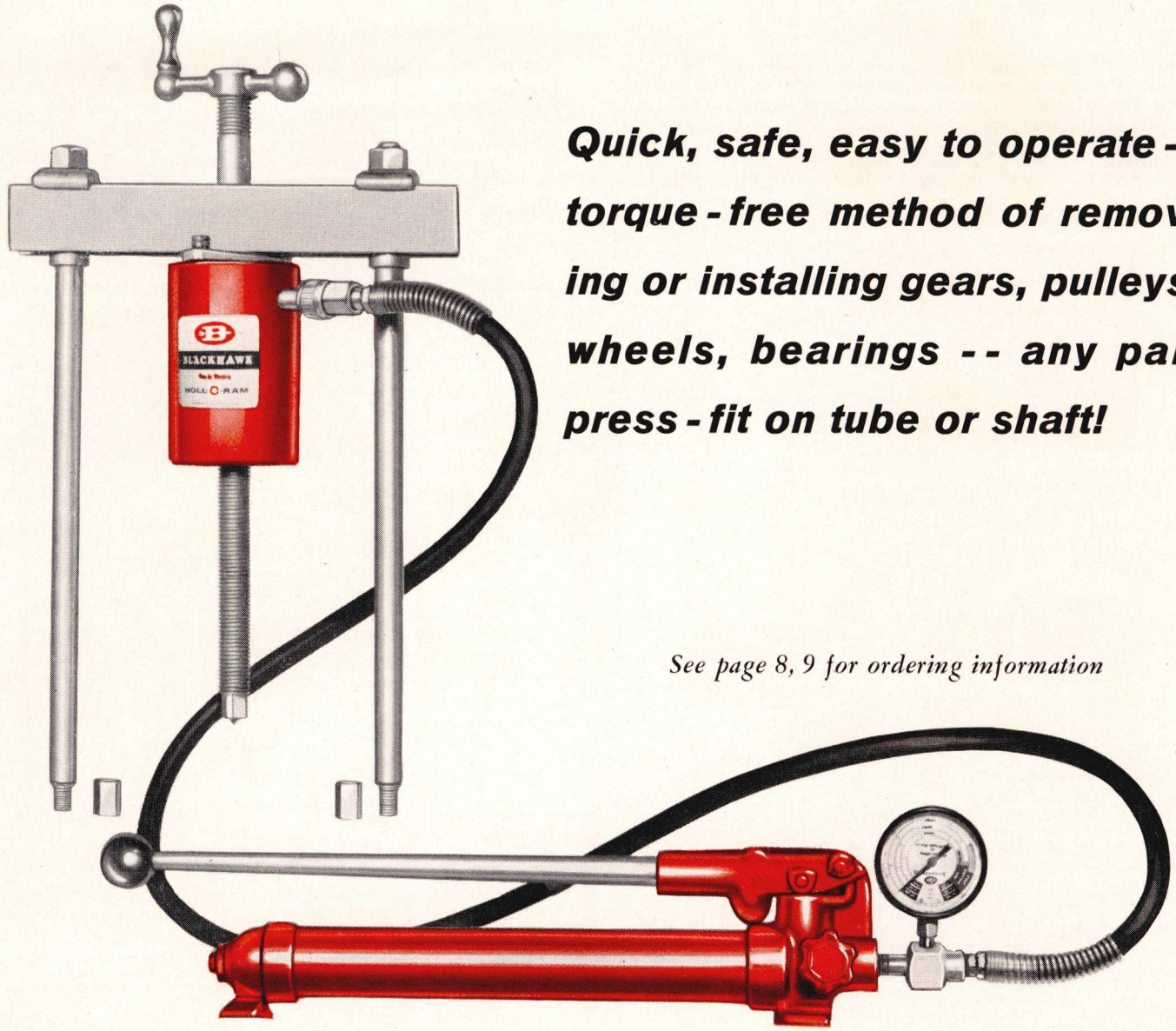
RAM MOUNTING AND ADJUSTING ATTACHMENT SPECIFICATIONS

	Set No.	HP-220 Contains	HP-320 Contains	HP-520 Contains
Threaded Hollow Saddle	Part Number (1 in)	HP-2014	HP-3014	HP-5014
	Specifications	See Schedule "HOLLOW RAM PLUNGER SADDLES"		
Ram Base Attaching Screw	Part Number (2 in)	HP-2013	HP-2013	HP-5013
	Knurled Allen Head Cap Screw	⅜"-16, ¾"	⅜"-16, ¾"	½"-13, 1¼"
Attaching End Adjusting End Adjusting Screw	Part Number (1 in)	HP-2011	HP-3011	HP-5011
	Length	20"	24"	30"
	Attachment Thread (NC-2A)	1"-8, 1"	1¼"-7, 1½"	1⅝"-5½, 1½"
	Adjustment Thread (NC-2A)	1"-8, 10½"	1¼"-7, 12½"	1⅝"-5½, 18⅞"
	Milled Square Ends	1 1/16" sq., ¾" long	1 3/16" sq., 1" long	1" sq., 1" long
	Center Point, angle base dia.	60°, 5/16"	60°, 1 1/32"	60°, ⅜"
Speed Crank	Part Number (1 in)	HP-2010	HP-3010	HP-5010
	Square Center	1 1/16" sq.	1 3/16"sq.	1" sq.
Total Set Weight		5 lbs.	10 lbs.	20 lbs.
Speed Nut (Optional)	Part Number (1 in)	HP-2033	HP-3033	HP-5033
	Tapped Center, (NC-3B)	1"-8, 1⅛"	1¼"-7, 1⅜"	1⅝"-5½, 1⅜"
	Weight	2 lbs.	3 lbs.	5 lbs.

BLACKHAWK®

NEW HYDRAULIC

activated by 20, 30

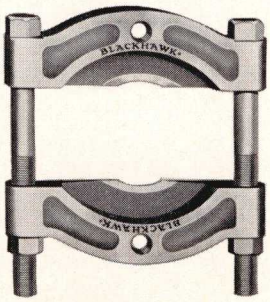


Quick, safe, easy to operate -- torque-free method of removing or installing gears, pulleys, wheels, bearings -- any part press-fit on tube or shaft!

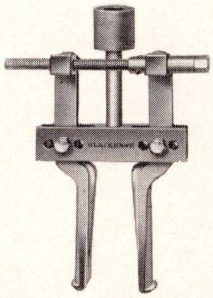
See page 8, 9 for ordering information

• *See pages 16-17 for complete Master Puller Assortments.*

BLACKHAWK BEARING PULLING ATTACHMENTS—Use with Blackhawk Hydraulic Push-Puller for installing or removing bearings. Will not distort bearings! Can be forced between closely fitted parts where space does not permit attaching puller behind part to be pulled. Gives more bearing surface for installing and removing applications—no damage to gears and parts.



See page 15 for specifications



See page 14 for specifications

BLACKHAWK BEARING CUP PULLING ATTACHMENTS Used with Blackhawk Hydraulic Push-Pullers to remove bearing cups (outer races) from blind holes **without damaging** these precision parts. Jaws get under and behind race. All Bearing Cup Pulling Attachments size-matched to Blackhawk Push-Pullers.

PUSH-PULLERS

HYDRAULIC PUSH PULLERS

and 60-ton Holl-O-Ram Units

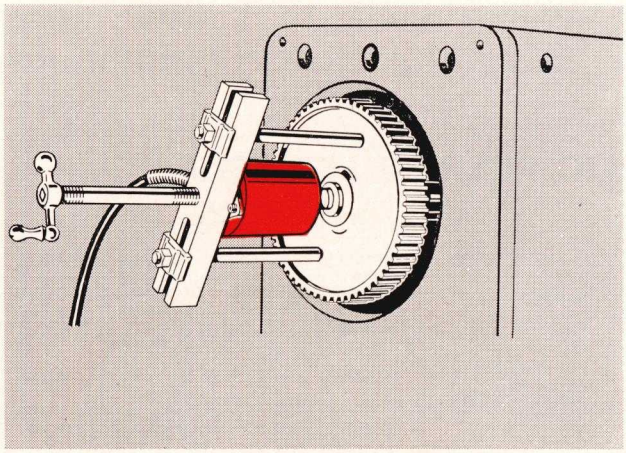
HYDRAULIC PUSH-PULLERS—Here's the basic set that obsoletes ordinary makeshift mechanical and hydraulic pulling methods—for removing and installing gears, bearings, bearing cones, bearing cups, pulleys, wheels, shafts, axles, bushings, couplings, sleeves, pinions, sprockets, housings, pins, tapered pins, sheaves, keys and other closely fitted machine parts. Amazing flexibility is gained because of extreme reach and spread that handles any tough pulling or installing problem with hydraulic ease. Attach directly to work.

Hydraulic Push-Pullers are fast, safe, efficient! No more galled shafts or other damaged parts. No need to ever damage machine parts by hammering, heating, or prying. Costly machine downtime is cut from tortuous hours to minutes. Even the toughest pressed fits are off with a few strokes of the pump.

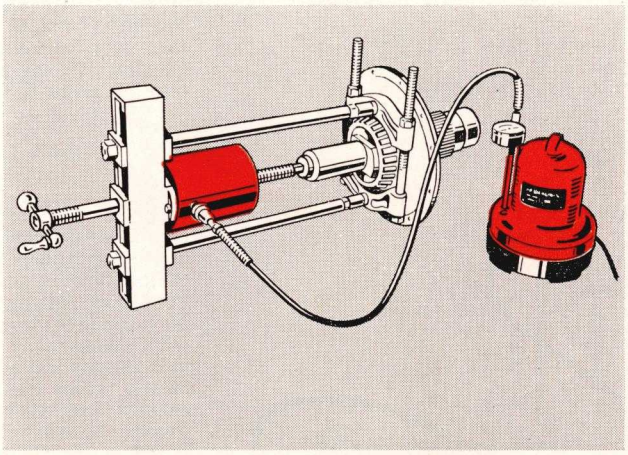
Rugged, remote controlled Hydraulic HOLL-O-RAM unit, equipped with safety color-coded gauge, gives the operator absolute control for the utmost efficiency and safety. Hydraulic Push-Pullers are a **must** in every industrial and construction shop to remove and install parts the **right** way! For ordering details and specifications, see pages 8, 9, 16, 17.

Industry's most needed tool . . .

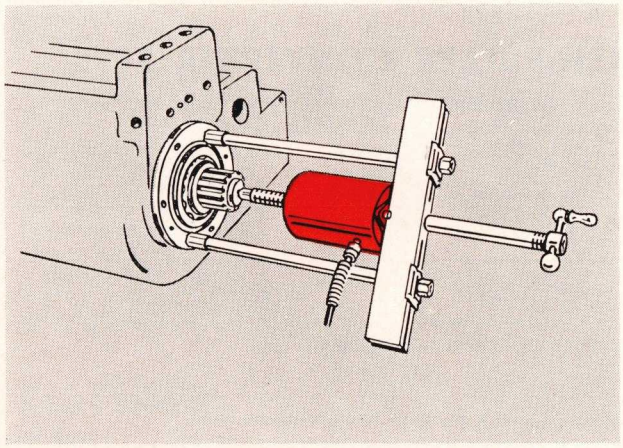
Blackhawk Hydraulic Push-Pullers . . . in 3 capacities



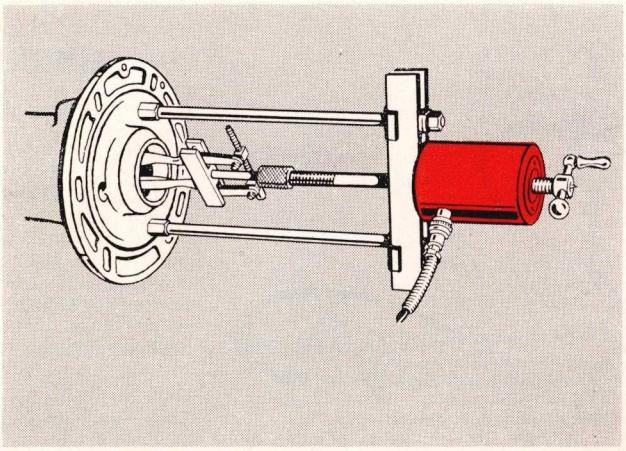
Removing gear from spline shaft with Hydraulic Push-Puller. Push-Puller legs thread into web of gear. Shaft Protector safeguards center hole of shaft.



Removing tapered roller bearing from solid shaft with Hydraulic Push-Puller, using Bearing Pulling Attachment and P-182 Electrically Driven Pump.



Installing drive shaft with Hydraulic Push-Pullers. Reducers thread over housing studs. Push-Puller attaches to Reducers. Step-Plate adaptor provides adjusting screw contact point.



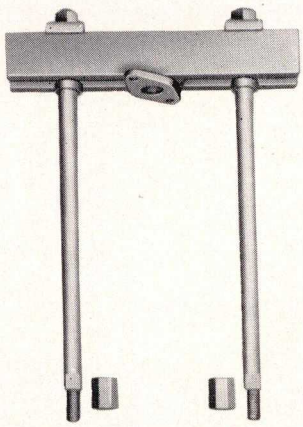
Removing bearing cup from housing with Hydraulic Push-Puller, Bearing Cup Pulling Attachment. Push-Puller attaches to Adaptors, threaded into housing.

BLACKHAWK®

SPECIFICATIONS

NEW HYDRAULIC PUSH-PULLERS

Blackhawk pulling assemblies are made to operate with 20, 30 or 60-ton HOLL-O-RAM Hydraulic Units



Push-Pulling Assembly

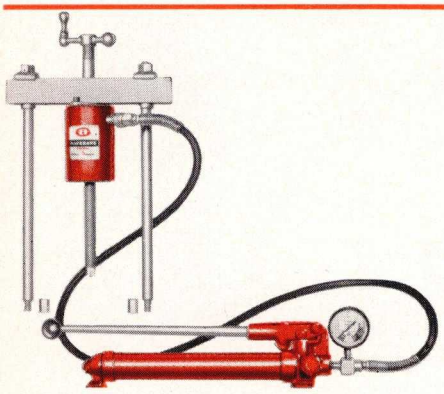
PUSH-PULLING ASSEMBLY

Blackhawk offers the right tools for the right job! Here is a complete range of pulling assemblies for powerful 20, 30 and 60-ton Holl-O-Ram hydraulic units. Four complete assemblies give great range of applications with two big 30-ton Push-Puller Assemblies in this popular capacity. Assembly **spread** applications vary with placement of legs in crossblock. Assembly **reach** applications vary with interchangeable leg lengths . . . **see table at bottom of page 9 for leg sets.**

PUSH-PULLING ASSEMBLIES AND CONTENTS LISTING

Assembly No.	HP-201 Contains	HP-301 Contains	HP-304* Contains	HP-501 Contains
Push-Puller Crossblock	HP-2003	HP-3003	HP-3004	HP-5003
Legs (pair) No. Lngth.	HP-2007 (16½")	HP-3007 (18")	HP-3037 18"	HP-5007 (24")
Sliding Plate (2 in)	HP-2005	HP-3005	HP-3035	HP-5002
Sliding Plate (2 in)	—	—	—	HP-5005
Leg Washer (2 in)	HP-2002	HP-3002	HP-3032	—
Leg Nut (2 in)	HP-2001	HP-3001	HP-3031	HP-5001
Leg End (2 in)	HP-2009	HP-3009	HP-3039	—
Weight	19½ lbs.	33¼ lbs.	42 lbs.	107½ lbs.

* Extra strong 30-ton assembly, with wider 18" cross-block for greater range of applications.



Hydraulic Push-Puller

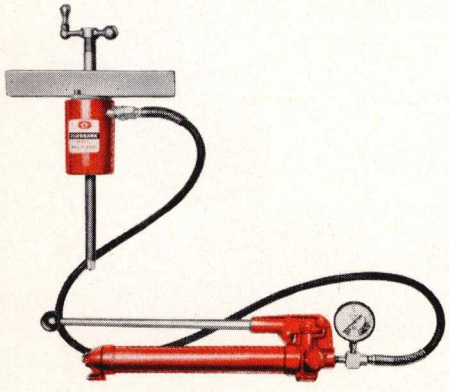
HYDRAULIC PUSH-PULLER SETS

Smooth, powerful, torque-free hydraulic power is harnessed in these four sets to make the toughest pulling or installing problems simple! Maintenance work is a snap with these easy-to-use time and money savers . . . heart of the puller line. And applications of these sets are greatly broadened when combined with Bearing Pulling Attachment and Bearing Cup Pulling Attachment. **See pages 14-15.**

HYDRAULIC PUSH-PULLER SETS AND CONTENTS LISTING

Set No.	HP-200-G Contains	HP-300-G Contains	HP-303-G* Contains	HP-500-G Contains
Hydraulic Unit	HP-20-G	HP-30-G		HP-60-G
Hollow Ram Mounting and Adjusting Attachment Set	HP-220	HP-320		HP-520
Push-Pulling Assembly	HP-201	HP-301	HP-304	HP-501

* Extra strong 30-ton set, with wider 18" cross-block for greater range of applications.



Hydraulic Push-Puller Converter

HYDRAULIC PUSH-PULLER CONVERTER SETS

Convert your out-dated mechanical pullers into fast, time-saving Blackhawk Hydraulic Push-Pullers. Low-cost converter sets, with unique cross-blocks, hook-up in seconds with most present puller legs, user-made parts, etc. for faster, easier maintenance work. Hydraulic Units solve more problems, too. **See page 3.**

HYDRAULIC PUSH-PULLER CONVERTER SETS AND CONTENTS LISTING

Set No.	HP-202-G Contains	HP-302-G Contains	HP-305-G* Contains
Hydraulic Unit	HP-20-G	HP-30-G	HP-30-G
Mounting and Adjusting Attachment Set	HP-220	HP-320	
Push-Puller Crossblock	HP-2003	HP-3003	HP-3004

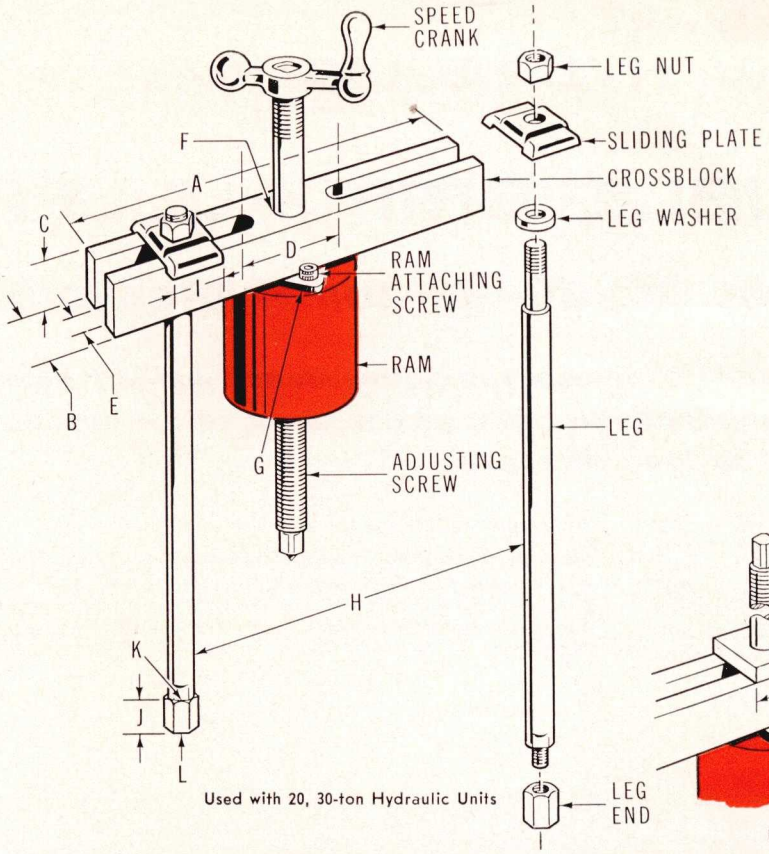
* Extra strong 30-ton set, with wider 18" cross-block for greater range of applications.

After "HP-," first number (2, 3 or 5) denotes use with 20, 30 or 60-ton hydraulic units.

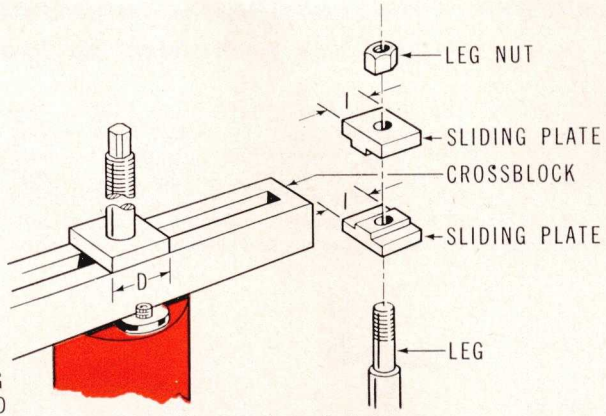
Assemblies for use with 20-ton Hydraulic Units have a capacity of 17½ tons. Assemblies for use with 30-ton Hydraulic Units have a capacity of 30 tons. Assemblies for use with 60-ton Hydraulic Units have a capacity of 50 tons. To eliminate possibility of exceeding load limits of assemblies or rams, it is extremely important to use gauge to determine exact load at all times.

NOTE! See Page 18 for information and specifications on Adaptors, Reducers, Step-Plate Adaptors and Shaft Protectors . . . important accessories that are necessary for broad puller applications.

PUSH PULLER SPECIFICATIONS



Used with 20, 30-ton Hydraulic Units



Used with 60-ton Hydraulic Unit

Dimensions of Push-Pulling Assemblies

Push-Pulling Assembly	HP-201	HP-301	HP-304	HP-501
Crossblock	HP-2003	HP-3003	HP-3004	HP-5003
A—Width	13½"	16"	18"	24"
B x C—Block Size	2"x2"	2¼"x2¼"	2½"x2½"	3¾"x4"
D—Between Slot centers	3½"	5¼"	7"	4¾"
E—Slot width, Slot ends	¾", open	1", open		1¾", closed
F—Center hole	1 1/16" dia.	1 5/16" dia.		1 11/16" dia.
G—Ram attaching side, Plate with 2 holes, 180° apart	¼" thick on 3¼" dia.	¼" thick on 3⅝" dia.		¾" thick on 5⅛" dia.
H—Spread between Legs Min. (with Ram in place)—Max.	5⅜"-11 11/16"	5½"-13¾"	7"-15¾"	8¾"-20"

Leg Nut	HP-2001	HP-3001	HP-3031	HP-5001
Sliding Plate	HP-2005	HP-3005	HP-3035	HP-5005 HP-5002
I—Sliding Plate Width	1 13/16"	2¼"		2½"
Leg Washer	HP-2002	HP-3002	HP-3032	none
Outside diameter	1¼"	1¾"		—
Legs (pair)	HP-2007	HP-3007	HP-3037	HP-5007
Specifications	See table of "Available Push-Puller Legs"			
Leg Ends	HP-2009	HP-3009	HP-3039	none
J—Length	1½"	1⅞"	2"	—
K—Internal Thread (NF-3B)	⅝"-18, 1 3/16"	1"-14, 1¼"	1"-14, 1⅜"	—
L—Bottom Surface	Flat Diamond Knurl			

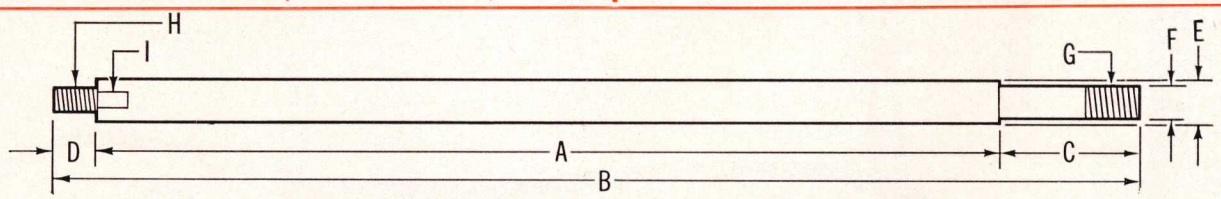


Table of available push-puller legs

For Use With Set No.	HP-201, HP-200-G, HP-202-G				HP-301, HP-300-G, HP-302-G			HP-304, HP-303-G, HP-305-G			HP-501, HP-500-G	
Containing Crossblock No.	HP-2003				HP-3003			HP-3004			HP-5003	
Legs (pair)	HP-2012	HP-2006	HP-2007	HP-2008	HP-3006	HP-3007	HP-3008	HP-3036	HP-3037	HP-3038	HP-5007	HP-5008
A—Effective Length	4½"	9½"	16½"	22½"	8"	18"	28"	8"	18"	28"	24"	34"
B—Extension or Overall Length	9¼"	14¼"	21¼"	27¼"	13½"	23½"	33½"	14 1/8"	24 1/8"	34 1/8"	32 5/16"	42 5/16"
C—Block End Length	3¾"				4⅜"			4⅞"			6 9/16"	
D—Attaching End Length	1"				1⅛"			1¼"			1¾"	
E—Stock Diameter	⅞"				1⅛"			1¼"			1⅝"	
F—Turned Diameter	¾"				1"			1"			1¼"	
G—Block End Thread (NF-3A)	¾"-16, 1"				1"-14, 1⅛"			1"-14, 1⅜"			1¼"-12, 1½"	
H—Attaching End Thread (NF-3A)	⅝"-18, 1"				1"-14, 1⅛"			1"-14, 1 1/16"			1¼"-12, 1½"	
I—Across Wrench Flats	¾"				1 1/32"			1 1/16"			1⅜"	
Weight (pair)	2½ lbs.	4¼ lbs.	6½ lbs.	9 lbs.	7 lbs.	12½ lbs.	18 lbs.	8 lbs.	15 lbs.	22 lbs.	34 lbs.	47 lbs.
To extend Leg's length, Connect one Leg to another with Reducer No.:	HP-2031				HP-3041			HP-3041			HP-2513	

Push-Puller Leg Sets and Contents Listing

For Use With Set No.	HP-201, HP-200-G, HP-202-G	HP-301, HP-300-G, HP-302-G	HP-304, HP-303-G, HP-305-G	HP-501, HP-500-G
Containing Crossblock No.	HP-2003	HP-3003	HP-3004	HP-5003
Set No.	HP-228 Contains	HP-327 Contains	HP-330 Contains	HP-528 Contains
Legs (pair)	HP-2012, HP-2006, HP-2008	HP-3006, HP-3008	HP-3036, HP-3038	HP-5008
Reducers (pair)	HP-2031	HP-3041		HP-2513
Adaptors (pair)	—	—	—	HP-2329

BLACKHAWK®

NEW HYDRAULIC

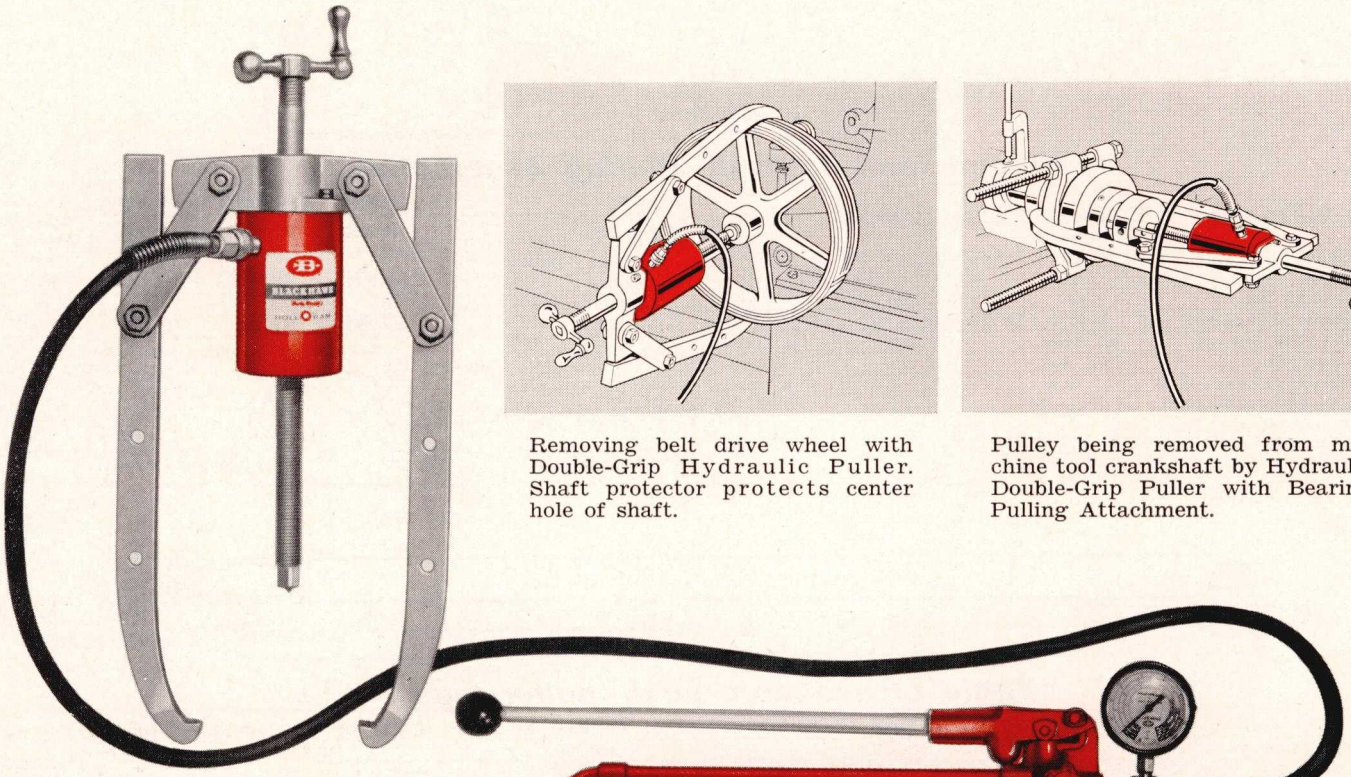
DOUBLE GRIP PULLERS

activated by 20-30-60-ton Hydraulic Units

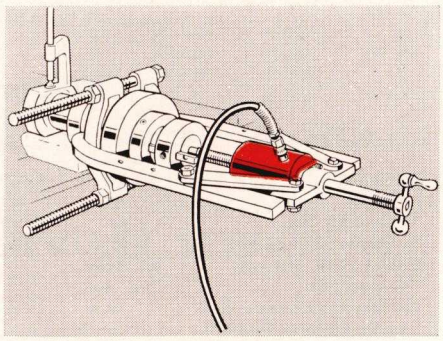
Short and Long Arm Double-Grip Pullers spread wide -- reach behind bearings, pulleys, sheaves, shafts, couplings, sleeves, gears, sprockets -- pulling tighter as load increases!

Easily adjustable, these Blackhawk Hydraulic Pullers are **big favorites** with maintenance men! Universal application! Ruggedly built Double-Grip Pullers spread-out—clamp-on parts to be removed from shaft with **vise-like jaw action!** Powered by extremely compact Blackhawk self-contained HOLL-O-RAM, these pullers obsolete, outmode tiresome mechanical methods. They're far faster, far superior to **any other hydraulic pullers** on the market today!

Grip Pullers are used where the job at hand does not permit attaching puller to housing directly or to part to be removed. Double-Grip Puller sets are available with two arm sizes—long and short. These arms both work with the same Double-Grip Crosshead.

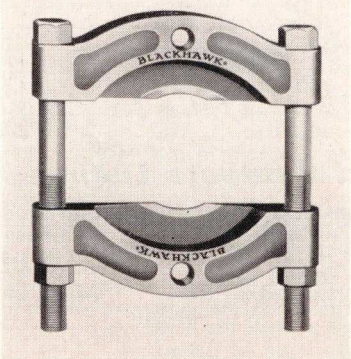


Removing belt drive wheel with Double-Grip Hydraulic Puller. Shaft protector protects center hole of shaft.



Pulley being removed from machine tool crankshaft by Hydraulic Double-Grip Puller with Bearing Pulling Attachment.

For complete ordering details and specifications, see page 12.



BLACKHAWK BEARING PULLING ATTACHMENT

For use with all Blackhawk Long or Short Arm Double-Grip Pullers. Can be forced into tight quarters separating parts where puller jaws cannot go. Act as grip surface for grip-puller arms where placed behind parts. **See page 15 for complete attachment specifications and applications.**

• *See pages 16-17 for complete Master Puller Assortments.*

NEW HYDRAULIC

HYDRAULIC GRIP PULLERS

TRIPLE GRIP PULLERS

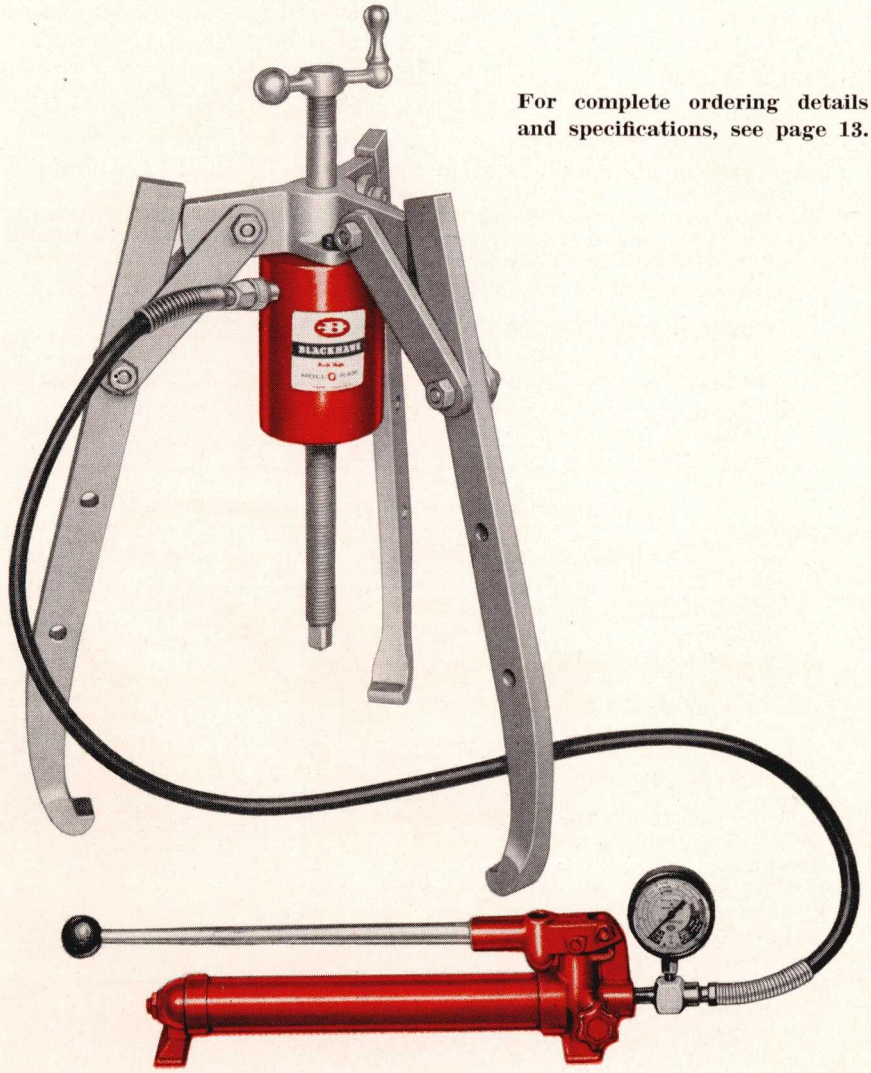
activated by 20-30-60-ton Hydraulic Units

Short and Long-Arm Hydraulic Triple-Grip Pullers . . . perfect for sprockets, spoked wheels or other shaft-mounted components -- where 3-arm contact is required for non-distorting, torque-free pulling!

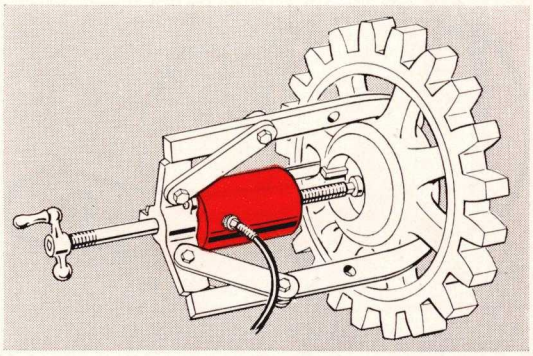
More bearing surface for those really tough maintenance pulling jobs where a triple-grip gives better leverage and spreads the load over a wider area. Adjusts readily to uneven pulling surface. Holl-O-Ram Triple-Grip Pullers hook between openings in wheels, gears, etc. having uneven openings.

Grip Puller reach varies with selection of arm holes for attachment to crosshead. Grip Puller spread varies with the degree that the arms swing on the straps from the crosshead. These two features offer unlimited set-ups with just one unit!

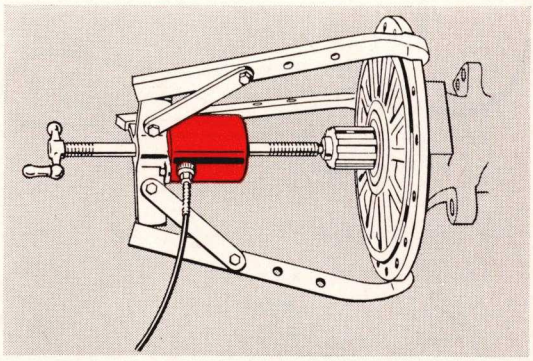
Triple-Grip Puller sets are available with two arm sizes—long and short. These arms both work with the same Triple-Grip Crosshead.



For complete ordering details and specifications, see page 13.



Removing sprocket from shaft using Hydraulic Triple-Grip Puller. Arms reach through sprocket spokes to tightly grip hub, pulling shaft key along with it.



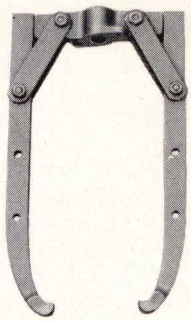
Installing spline shaft into housing using Hydraulic Triple-Grip Puller. Step-plate adaptor protects tapped shaft end.

• *See pages 16-17 for complete Master Puller Assortments.*

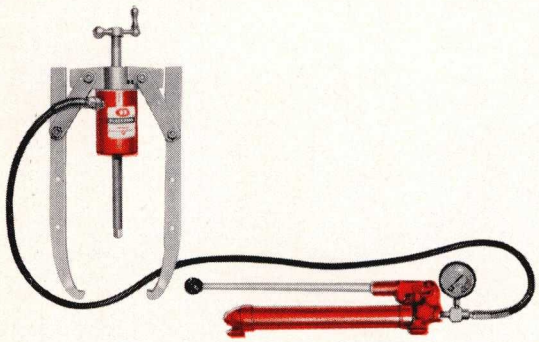
BLACKHAWK®

SPECIFICATIONS

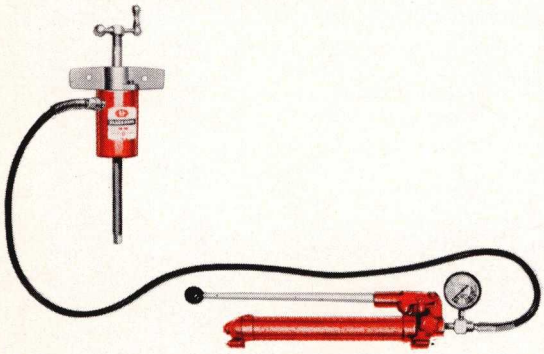
New hydraulic double-grip pullers



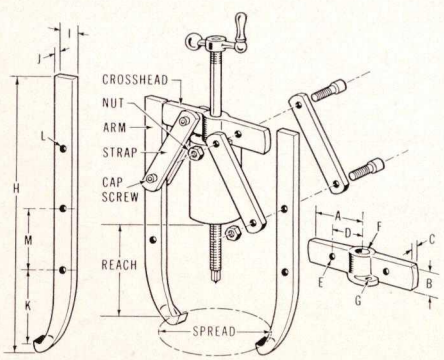
Double-Grip Assembly



Hydraulic Double-Grip Puller Set



Hydraulic Double-Grip Puller Converter Set



DOUBLE-GRIP PULLING ASSEMBLY—consists of double-grip crosshead, pair of long or short arms, straps, cap screws, and nuts. Same double-grip crosshead serves both long and short arms. Assemblies are made to operate with 20, 30 and 60-ton HOLL-O-RAM hydraulic units.

DOUBLE-GRIP PULLING ASSEMBLIES AND CONTENTS LISTING

Assembly No.	Short arm HP-210 / Long arm HP-207	Short arm HP-310 / Long arm HP-307	Short arm HP-510 / Long arm HP-507
	Contains	Contains	Contains
Double-Grip Crosshead	HP-2020	HP-3020	HP-5020
Arms (2 in)	HP-2024 / HP-2025	HP-3024 / HP-3025	HP-5024 / HP-5025
Straps (4 in)	HP-2021	HP-3021	HP-5021
Cap Screws (4 in)	HP-2022	HP-3022	HP-5022
Nuts (4 in)	HP-2023	HP-3023	HP-5023
Weight	21 lbs. / 24 lbs.	51 lbs. / 58 lbs.	102 lbs. / 112 lbs.

HYDRAULIC DOUBLE-GRIP PULLER—consists of complete double-grip pulling assembly (with choice of long or short arms) and includes HOLL-O-RAM hydraulic unit, mounting and adjusting attachments for pullers. Made to operate with 20, 30 and 60-ton hydraulic units. May be ordered as complete long-arm or complete short-arm set.

HYDRAULIC DOUBLE-GRIP PULLER SETS AND CONTENTS LISTING

Set No.	Short arm HP-209-G / Long arm HP-206-G	Short arm HP-309-G / Long arm HP-306-G	Short arm HP-509-G / Long arm HP-506-G
	Contains	Contains	Contains
Hydraulic Unit	HP-20-G	HP-30-G	HP-60-G
Mounting and Adjusting Attachment Set	HP-220	HP-320	HP-520
Double-Grip Pulling Assembly	HP-210 / HP-207	HP-310 / HP-307	HP-510 / HP-507

HYDRAULIC DOUBLE-GRIP PULLER CONVERTER—consists of double-grip crosshead, HOLL-O-RAM hydraulic unit, ram mounting and adjusting attachments. These converters for use with 20 and 30-ton hydraulic units. Permits user to convert mechanical or self-made pullers into Blackhawk hydraulic double-grip pullers **simply** and **economically.**

For further Blackhawk hydraulic double-grip puller details, see page 10.

HYDRAULIC DOUBLE-GRIP PULLER CONVERTER SETS AND CONTENTS LISTING

Set No.	HP-208-G	HP-308-G
	Contains	Contains
Hydraulic Unit	HP-20-G	HP-30-G
Mounting and Adjusting Attachment Set	HP-220	HP-320
Double-Grip Crosshead	HP-2020	HP-3020

DIMENSIONS OF DOUBLE-GRIP PULLER ASSEMBLIES

Double-Grip Pulling Assembly	Short arm HP-210	Long arm HP-207	Short arm HP-310	Long arm HP-307	Short arm HP-510	Long arm HP-507
Double-Grip Crosshead	HP-2020		HP-3020		HP-5020	
A—Shoulders' length	4 1/2"		5 1/2"		8"	
B—Shoulders' end height	1 3/4"		2 1/2"		3 1/2"	
C—Shoulders' width	3/4"		1"		1 1/4"	
D—Center hole to shoulder hole	2 9/16"		3 1/4"		4 1/4"	
E—Shoulders' hole	37/64"		23/32"		1 1/64"	
F—Center hole	1 1/16"		1 5/16"		1 11/16"	
G—Ram attaching side, Flange with 2 holes, 180° apart	3/8" thk. on 3 1/4" dia.		1/2" thk. on 3 5/8" dia.		1/2" thk. on 5 1/8" dia.	
Arms	HP-2024	HP-2025	HP-3024	HP-3025	HP-5024	HP-5025
H—Overall length	16 3/4"	21"	25 1/4"	31 3/4"	31"	43"
I x J—Shank width x thickness	1 1/2" x 3/4"		2" x 1"		2 1/2" x 1 1/4"	
K—Jaw depth to first hole	5 15/16"		7 1/4"		11 3/4"	17 3/4"
L—No. of Arm holes, Drill size	3, 37/64"		3, 23/32"	4, 23/32"	2, 1 1/64"	3, 1 1/64"
M—Distance between Arm holes	4 1/2"		4"	4 5/8"	6"	
Straps	HP-2021		HP-3021		HP-5021	
Cap Screws	HP-2022		HP-3022		HP-5022	
Nuts	HP-2023		HP-3023		HP-5023	
Reach	8"	12"	14 3/4"	20 3/4"	16 5/8"	28 7/8"
Spread: Min.-Max.	0-14"	0-16"	0-20"	0-26"	0-30"	0-36"

After "HP-," first number (2, 3 or 5) denotes use with 20, 30 or 60-ton hydraulic units.

Assemblies for use with 20-ton Hydraulic Units have a capacity of 17½ tons. Assemblies for use with 30-ton Hydraulic Units have a capacity of 30 tons. Assemblies for use with 60-ton Hydraulic Units have a capacity of 50 tons. To eliminate possibility of exceeding load limits of assemblies or rams, it is extremely important to use gauge to determine exact load at all times.

NOTE! See Page 18 for information and specifications on Adaptors, Reducers, Step-Plate Adaptors and Shaft Protectors . . . important accessories that are necessary for broad puller applications.

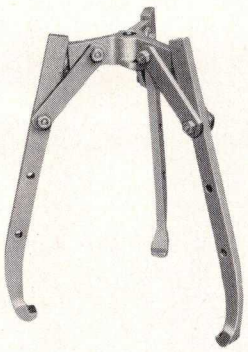
HYDRAULIC GRIP PULLER SPECIFICATIONS

New hydraulic triple-grip pullers

TRIPLE-GRIP PULLING ASSEMBLY—even more grip power for pulling applications. Made for use with 20, 30 and 60-ton hydraulic units. Choice of six complete assemblies to fit your particular maintenance and application needs . . . choice of long and short arm.

TRIPLE-GRIP PULLING ASSEMBLIES AND CONTENTS LISTING

Assembly No.	Short arm HP-215	Long arm HP-212	Short arm HP-315	Long arm HP-312	Short arm HP-515	Long arm HP-512
	Contains		Contains		Contains	
Triple-Grip Crosshead	HP-2030		HP-3030		HP-5030	
Arms (2 in)	HP-2024	HP-2025	HP-3024	HP-3025	HP-5024	HP-5025
Straps (6 in)	HP-2021		HP-3021		HP-5021	
Cap Screws (6 in)	HP-2022		HP-3022		HP-5022	
Nuts (6 in)	HP-2023		HP-3023		HP-5023	
Weight	33 lbs.	36 lbs.	80 lbs.	90 lbs.	151 lbs.	183 lbs.

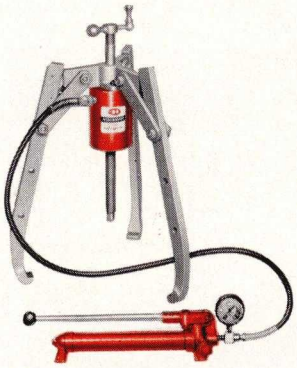


Triple-Grip Assembly

HYDRAULIC TRIPLE-GRIP PULLER SET—power-package for smooth, torque-free maintenance application. Three capacities—choice of six complete sets, long or short arm. Extend range of uses by switching extra arms.

HYDRAULIC TRIPLE-GRIP PULLER SETS AND CONTENTS LISTING

Set No.	Short arm HP-214-G	Long arm HP-211-G	Short arm HP-314-G	Long arm HP-311-G	Short arm HP-514-G	Long arm HP-511-G
	Contains		Contains		Contains	
Hydraulic Unit	HP-20-G		HP-30-G		HP-60-G	
Mounting and Adjusting Attachment Set	HP-220		HP-320		HP-520	
Triple-Grip Pulling Assembly	HP-215	HP-212	HP-315	HP-312	HP-515	HP-512

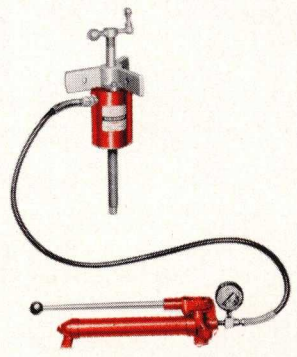


Hydraulic Triple-Grip Puller Set

HYDRAULIC TRIPLE-GRIP PULLER CONVERTER SETS—convert your out-dated mechanical pullers into fast, time-saving hydraulic grip pullers. Low-cost converter sets, with unique crossheads, hook-up in seconds with most grip puller parts for faster, easier maintenance work.

HYDRAULIC TRIPLE-GRIP PULLER CONVERTER SETS AND CONTENTS LISTING

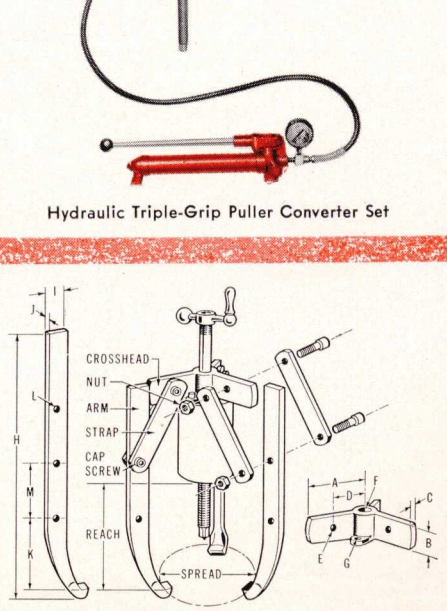
Set No.	HP-213-G	HP-313-G
	Contains	Contains
Hydraulic Unit	HP-20-G	HP-30-G
Mounting and Adjusting Attachment Set	HP-220	HP-320
Triple-Grip Crosshead	HP-2030	HP-3030



Hydraulic Triple-Grip Puller Converter Set

DIMENSIONS OF TRIPLE-GRIP PULLER ASSEMBLIES

Triple-Grip Pulling Assembly	Short arm HP-215	Long arm HP-212	Short arm HP-315	Long arm HP-312	Short arm HP-515	Long arm HP-512
Triple-Grip Crosshead	HP-2030		HP-3030		HP-5030	
A—Shoulders' length	4 1/2"		5 1/2"		8"	
B—Shoulders' end height	1 3/4"		2 1/2"		2 7/8"	
C—Shoulders' width	3/4"		1"		1 1/4"	
D—Center hole to shoulder hole	2 9/16"		3 1/4"		4 1/4"	
E—Shoulders' hole	37/64"		23/32"		1 1/64"	
F—Center hole	1 1/16"		1 5/16"		1 11/16"	
G—Ram attaching side, Flange with 2 holes, 180° apart	3/8" thk. on 3 1/4" dia.		1/2" thk. on 3 5/8" dia.		1/2" thk. on 5 1/8" dia.	
Arms	HP-2024	HP-2025	HP-3024	HP-3025	HP-5024	HP-5025
H—Overall length	16 3/4"	21"	25 1/4"	31 3/4"	31"	43"
I x J—Shank width x thickness	1 1/2" x 3/4"		2" x 1"		2 1/2" x 1 1/4"	
K—Jaw depth to first hole	5 5/16"		7 1/4"		11 3/4"	17 3/4"
L—No. of Arm holes, Drill size	2, 37/64"	3, 37/64"	3, 23/32"	4, 23/32"	2, 1 1/64"	3, 1 1/64"
M—Distance between Arm holes	4 1/2"		4"	4 5/8"	6"	
Straps	HP-2021		HP-3021		HP-5021	
Cap Screws	HP-2022		HP-3022		HP-5022	
Nuts	HP-2023		HP-3023		HP-5023	
Reach	8"	12"	14 3/4"	20 3/4"	16 5/8"	28 7/8"
Spread: Min.-Max.	0-17"	0-20"	0-26"	0-34"	0-36"	0-44"



After "HP-," first number (2, 3 or 5) denotes use with 20, 30 or 60-ton tydraulic units.

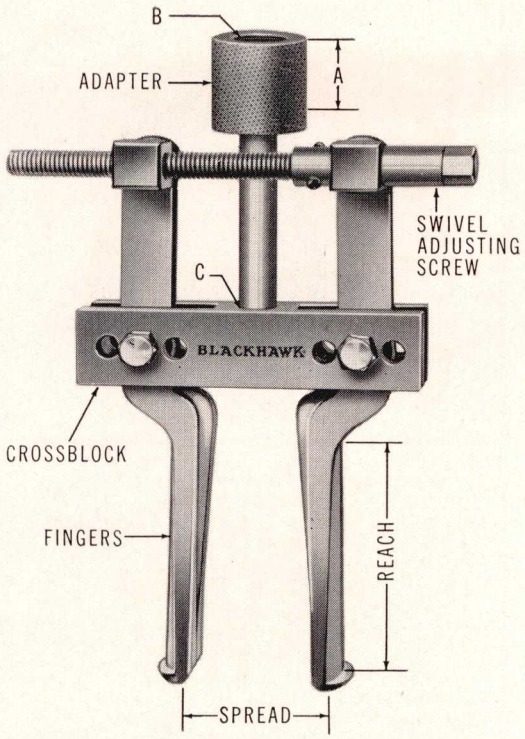
Assemblies for use with 20-ton Hydraulic Units have a capacity of 17½ tons. Assemblies for use with 30-ton Hydraulic Units have a capacity of 30 tons. Assemblies for use with 60-ton Hydraulic Units have a capacity of 50 tons. To eliminate possibility of exceeding load limits of assemblies or rams, it is extremely important to use gauge to determine exact load at all times.

NOTE! See Page 18 for information and specifications on Adaptors, Reducers, Step-Plate Adaptors and Shaft Protectors . . . important accessories that are necessary for broad puller applications.

BLACKHAWK®

SPECIFICATIONS

Bearing-cup pulling attachments



Protect precision parts . . . Save on costly replacement . . . Use a Bearing Cup Pulling Attachment with your Hydraulic Push-Puller!

Pulling bearing cups, outer races, oil seals, inner bearings, bushings, etc., from blind holes is no longer a tough, wasteful, time-consuming job. These are simple applications when a Bearing Cup Pulling Attachment is used with Blackhawk's Holl-O-Ram Hydraulic Push-Puller. Now torque-free, powerful hydraulic force does the job in seconds without damage to expensive parts.

Parallel alignment of the pulling members is readily obtained by setting them in fixed positions on the crossblock. Strong fingers reach to a depth of 5⅞" and offer a spread range of 1½" to 9" inside diameter. This is an invaluable attachment for your maintenance pulling work!

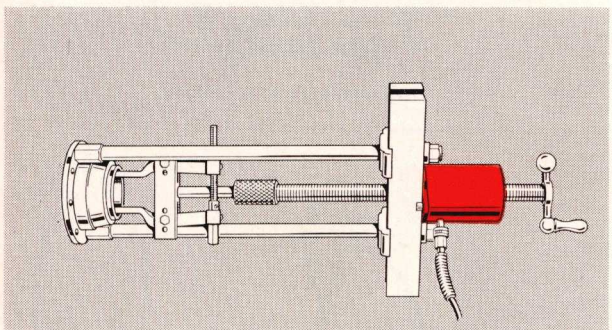
BEARING CUP PULLING ATTACHMENTS AND CONTENTS LISTING

Attachment No.	HP-219 Contains	HP-217 Contains	HP-218 Contains	HP-318* Contains	HP-319* Contains
For use w/Hyd. Push-Puller Set No.	HP-200-G			HP-300-G, HP-303-G	
Crossblock (1 in)	HP-20008			HP-30008	HP-30018
Fingers (2 in)	HP-20019	HP-20017	HP-20018	HP-30007	HP-30017
Cap Screw (2 in)	HP-20014			HP-30014	HP-30024
Nut (4 in)	HP-20015			HP-30015	HP-30025
Swivel Adjusting Screw (1 in)	HP-20009			HP-30009	HP-30019
Plain Swivel (1 in)	HP-20011			HP-30011	HP-30021
Collar (1 in)	HP-20012			HP-30012	HP-30022
Drive Screw (1 in)	HP-20013			HP-30013	HP-30023
Tapped Swivel (1 in)	HP-20010			HP-30010	HP-30020
Adaptor (1 in)	HP-20016			HP-30016	HP-30016
Weight	4 lbs.	4¼ lbs.	4½ lbs.	9½ lbs.	13½ lbs.

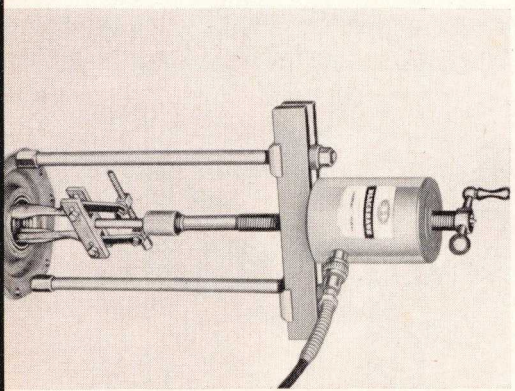
* To use with Push-Puller HP-500-G, add Bearing Cup Pulling Attachment Adaptor No. 30026.

TABLE OF BEARING CUP PULLING ATTACHMENTS SPECIFICATIONS

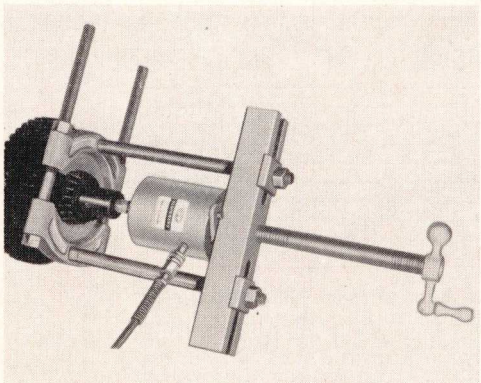
Attachment No.	HP-219	HP-217	HP-218	HP-318	HP-319
Fingers' Effective Reach	2⅛"	4"	5¼"	5"	5⅞"
Spread between Fingers: Min.-Max.	1½"-5"		1½"-6"	2½"-7"	3"-9"
A—Female, drilled depth	2½"			2 1/16"	
B—Female Thread (NC-2B)	1"-8, 1⅛"			1¼"-7, 1¼"	
C—Thread and Tap (NF)	⅝"-18			1"-14	



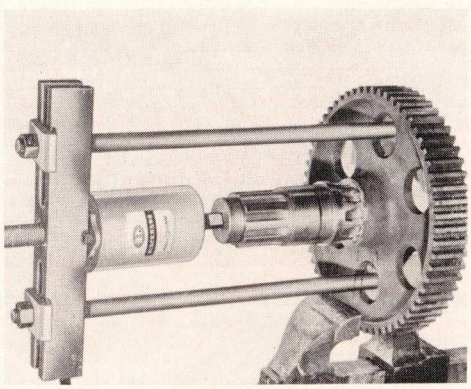
Hydraulic Push-Puller setup for removing bearing cup with Bearing Cup Pulling Attachment.



Pulling bearing cup (outer race) from blind hole of machine shaft with Bearing Cup Pulling Attachment. Leg Adaptors are threaded into shaft housing flange.



Pulling tapered roller bearing from shaft with Hydraulic Push-Puller, with Puller Legs threaded directly into Bearing Pulling Attachment.



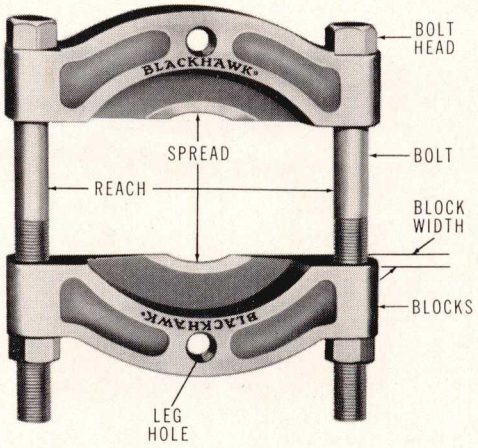
Pushing spline shaft into gear with Hydraulic Push-Puller. Push-Puller Legs are connected through gear holes into Bearing Pulling Attachment.

Bearing pulling attachments

Versatile tools get between or behind close fitting parts to give sure grip, more bearing surface!

Now you can separate tight or close fitting parts by getting behind the part to be pulled with a powerful, tight grip. Hydraulic HOLL-O-RAM equipped Push-Pullers or Double-Grip Pullers using these sharp-edged Bearing Pulling Attachments can be forced into close tolerance locations —where Two or Three Grip Puller arms cannot go. These essential Bearing Pulling Attachments boost utility of Blackhawk Hydraulic Pullers over 50%. These attachments are ideal for installation too! Will not mar or distort parts when pulling or installing.

Big jobs become small when you have these easy-to-use attachments for use with Push-Pullers. Here are just a few ways to use them: **Press Bed**—for portable press. . . . **Press Bed Adaptor**—to give varied spread to bed rails of stationary press. . . . **Base**—for pulling from blind holes with Bearing Cup Puller. . . . **Pulling Block**—anchor behind shaft driven equipment to be pulled. . . . **Installing Block**—bears against shaft driven equipment to be installed. . . . **Bridge Base**—when pulling shafts.



BEARING PULLING ATTACHMENTS AND CONTENTS LISTING

Attachment No.	HP-216 Contains	HP-316 Contains	HP-317 Contains	HP-516 Contains	HP-517 Contains
Block	HP-20001	HP-30001	HP-30004	HP-50001	HP-50005
Bolt	HP-20002	HP-30002	HP-30005	HP-50002	HP-50006
Nut	HP-20003	HP-30003	HP-30006	HP-50003	HP-50007
Pulling Tee	—	—	—	HP-50004	HP-50008
Weight	11 lbs.	19¾ lbs.	41¾ lbs.	100 lbs.	197 lbs.

BEARING PULLING ATTACHMENT SPECIFICATIONS

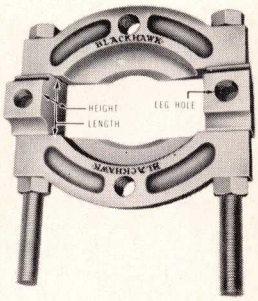
Attachment No.	HP-216	HP-316	HP-317	HP-516	HP-517
Use with Hydraulic Push-Puller Set No.	HP-200-G	HP-300-G, 303-G		See Notes below	
Use with Hydraulic Double-Grip Puller Set No.	HP-206-G, 209-G		HP-306-G, 309-G	HP-506-G, 509-G	
Reach between Bolts	6"	7⅛"	10"	13"	16¾"
Spread between Blocks: Min.-Max.	1"-5¾"	1"-7½"	1"-9"	5¾"-12½"	6¾"-16"
Bolt Diameter	¾"	⅞"	1⅛"	1½"	1¾"
Bolt Head (Nut)	Removable	Fixed		Fixed	
Block Width	1¼"	1⅜"	1⅞"	2¼"	2¾"
Block, Leg Hole Thread	⅝"-18, 1¼"	1"-14, 1⅜"	1"-14, 1⅞"	1¾"-12, 2¼"	1¾"-12, 2¾"
Pulling Tees	—	—	—	6" x 4½" high	
Leg Hole Thread	—	—	—	1¾"-12, 2"	

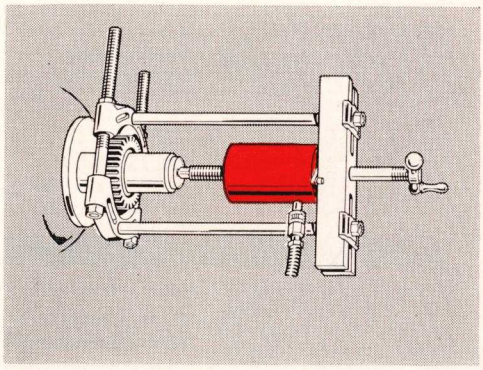
Note 1. To use Bearing Pulling Attachments HP-516 and HP-517 with Hydraulic Push-Puller Set No. HP-500-G use two Push-Puller Leg Adaptors No. HP-2329*.

Note 2. To use Bearing Pulling Attachments HP-516 and HP-517 with Hydraulic Push-Puller Set No. HP-300-G and HP-303-G use two Push-Puller Leg Adaptors No. HP-2340*.

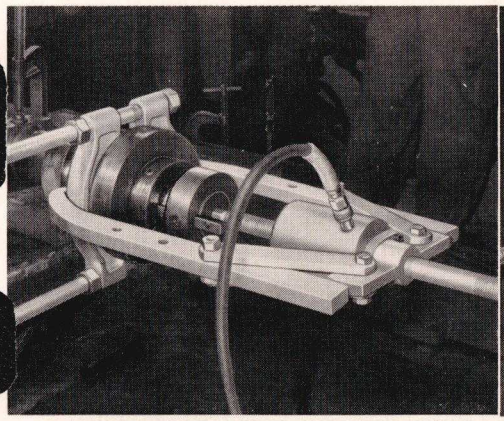
* These required Adaptors are contained in Push-Puller Attaching Sets (see page 18.)

Blackhawk Bearing Pulling Attachments HP-516 and HP-517 have pulling tees that fit on bolts between blocks to center and distribute heavy pulling loads on large pulling and installing applications using Push-Pullers: HP-300-G, 303-G, and 500-G.

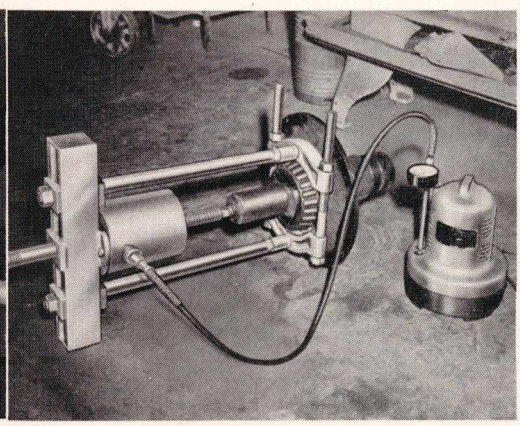




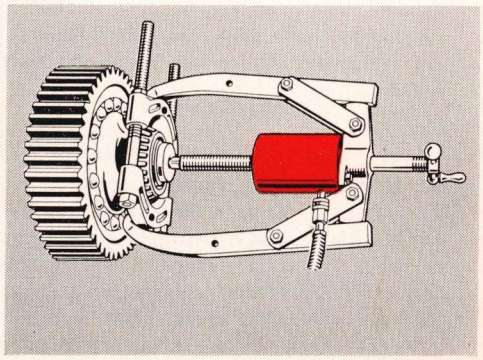
Bearing Pulling Attachment used with hydraulic Push-Puller to pull spur gear from shaft.



Pulling pulley wheel and key from machine tool crankshaft with Hydraulic Double-Grip Puller and Bearing Pulling Attachment. Puller arms grip blocks of Bearing Pulling Attachment fitted behind pulley.



Removing tapered roller bearing from solid shaft with Hydraulic Push-Puller, Bearing Pulling Attachment. Note use of Adaptors connecting Puller Legs to Bearing Pulling Attachment Blocks. Setup is powered by P-182 Electric-Driven Pump.

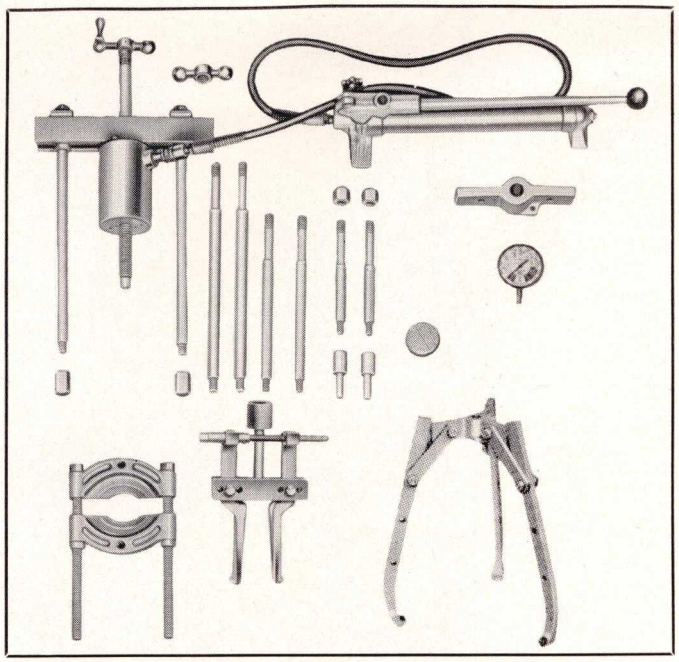


Bearing Pulling Attachment used with hydraulic Double-Grip Puller to pull roller bearing cup from shaft.

BLACKHAWK®

General

PULLER ASSORTMENTS



GENERAL PULLER ASSORTMENTS AND CONTENTS LISTING

Assortment No.	HP-221-G Contains	HP-321-G Contains
Hydraulic Unit	HP-20-G	HP-30-G
Ram Mounting and Adjusting Attachment	HP-220	HP-320
Speed Nut	HP-2033	HP-3033
Adjusting Screw Adaptor Set	HP-226	—
Adjusting Screw Push Adaptor	—	HP-3029
Adjusting Screw Push Adaptor	—	HP-3042
Push Pulling Assembly	HP-201	HP-304
Push-Puller Leg Set	HP-228	HP-330
Bearing Pulling Attachment	HP-216	HP-317
Bearing Cup Pulling Attachment	HP-218	HP-319
Long Arm Triple Grip Pulling Assembly	HP-212	HP-312
Double Grip Crosshead	HP-2020	HP-3020
Solid Serrated Saddle	HP-2026	HP-3026

Here are two complete assortment lines . . .

General Puller Assortments (described below) available in two tonnage capacities for low budget operations demanding the widest application range at the lowest possible cost.

Master Puller Assortments (described on next page) to provide entire deluxe pulling "workshops" in each tonnage capacity to meet any pulling or installing requirement.

These truly complete assortment lines contain specially selected sets and assemblies—described on other pages of this catalog—in one convenient "package" with all the tools you need to lick any pulling or installing operation. Here, in each pulling range, is unmatched set-up and application flexibility —with the versatile Push-Puller, Grip-Pullers with easily interchangeable Double-Grip and Triple-Grip Crossheads for quick set-up changes, Bearing Pulling Attachment to get behind close fitting parts, Bearing Cup Pulling Attachments to remove internal bearings PLUS complete accessory sets for any set-up requirement.

These assortments solve the problems of inadequate or incomplete equipment that cost heavily when breakdowns occur —provide you with a complete line of standard tools to handle special installing or removing jobs.

General Puller Assortments

HP-221-G **General Puller Assortment including 20-ton Holl-O-Ram**—the answer to the ever-growing demand for a low cost, wide-application assortment in this pulling range.

HP-321-G **General Puller Assortment including 30-ton Holl-O-Ram**—gives more power for those really tough pulling jobs, at a cost well within low-budget requirements.

Master Puller and Maintenance Assortments

Add "versatility plus" to your Master Puller Assortments (above, next page) with these Porto-Power maintenance assortments that enable you to do other jobs as move machinery and heavy equipment, brace shafts, wheels, and do countless other operations!

You get four Porto-Power Rams, from 4 thru 20-tons, working from the same pump furnished with the Master Puller Assortments. Rams exert full power in any direction, at any angle exactly where you need it; whether you position a machine or power a fixture. These units power an ingenious array of maintenance-application attachments that enable you to push, pull, lift, press, bend, spread and clamp in many different ways. Lock-On tubing cuts set-up assembly time 50%. Available in three assortment selections (described at right).

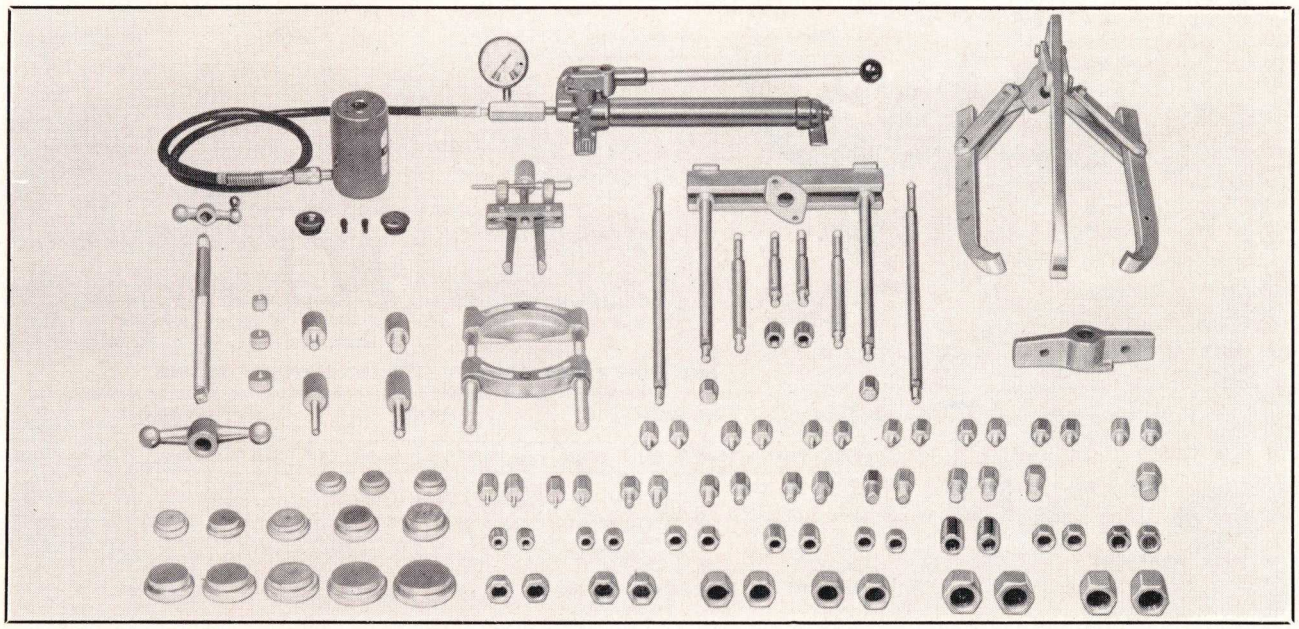
HP-222-G **Master Puller and Maintenance Assortment—includes HP-225-G Master Puller Assortment (above, next page), and Heavy-Duty Porto-Power Maintenance Equipment (right, next page)**—provides all the tools you need to do 1001 pulling and maintenance jobs.

HP-322-G **Master Puller and Maintenance Assortment—includes HP-325-G Master Puller Assortment (above, next page), and Heavy-Duty Porto-Power Maintenance Equipment (right, next page)**—more power for a wider range of pulling and installing applications, general maintenance jobs.

HP-223-G **Master Puller and Maintenance Assortment—includes HP-225-G Master Puller Assortment (above, next page), and Standard-Duty Porto-Power Maintenance Equipment (right, next page)**—makes every maintenance job a "snap," whether it's removing, installing, lifting, etc. with these job-engineered tools and attachments.

COMPLETE PULLER ASSORTMENTS

Master PULLER ASSORTMENTS



MASTER PULLER ASSORTMENTS AND CONTENTS LISTING

Assortment No.	HP-225-G Contains	HP-325-G Contains	HP-525-G Contains
Hydraulic Unit	HP-20-G	HP-30-G	HP-60-G
Ram Mounting and Adjusting Attachment	HP-220	HP-320	HP-520
Speed Nut	HP-2033	HP-3033	HP-5033
Adjusting Screw Contact Set	HP-227	HP-227	HP-227
Adjusting Screw Adaptor Set	HP-226	HP-326	HP-526
Push Pulling Assembly	HP-201	HP-304	HP-501
Push Puller Leg Set	HP-228	HP-330	HP-528
Push Puller Attaching Set	HP-229	HP-329	HP-529
Bearing Pulling Attachment	HP-216	HP-317	HP-516
Bearing Cup Pulling Attachment	HP-218	HP-318	HP-318
Bearing Cup Pulling Attachment Adaptor	—	—	HP-30026
Long Arm Triple Grip Pulling Assembly	HP-212	HP-312	HP-512
Double Grip Crosshead	HP-2020	HP-3020	HP-5020
Solid Serrated Saddle	HP-2026	HP-3026	HP-5026

Master Puller Assortment

HP-225-G **Master Puller Assortment including 20-ton Holl-O-Ram**—all you need to lick any pulling or installing job in this tonnage range.

HP-325-G **Master Puller Assortment including 30-ton Holl-O-Ram**—more power to "muscle" larger attachments for extra-wide range of pulling and installing operations.

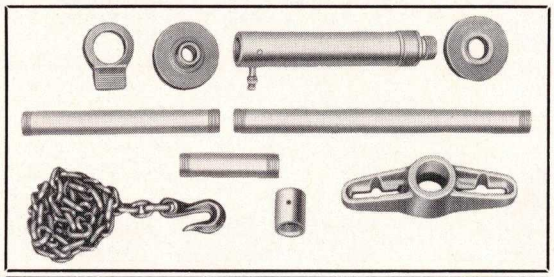
HP-525-G **Master Puller Assortment including 60-ton Holl-O-Ram**—puts 120,000 lbs. of brute force behind an array of attachments to beat the toughest "big job" operations.

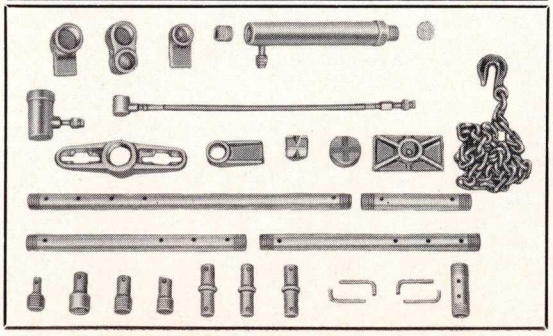
HEAVY-DUTY PORTO-POWER MAINTENANCE EQUIPMENT
(Contained in HP-222-G and HP-322-G Assortments)

Solid, 20-Ton, Long Stroke Ram	RC-224
Chain (8'), with Grab-Hook (2 in)	Z-218
Chain Pull Plate	Z-238
Steel Tubing 10"	Z-239,
Steel Tubing 20"	Z-240,
Steel Tubing 30"	Z-241
Steel Tube Coupling	Z-242
Ram Base	Z-243
Serrated Saddle	Z-436
Toe Lift	Z-595
Plunger Base	Z-607

STANDARD-DUTY PORTO-POWER MAINTENANCE EQUIPMENT
(Contained in HP-223-G Assortment)

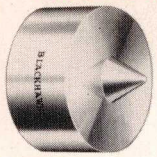
4-Ton "Midget" Ram	R-263
7-Ton "Shorty" Ram	RC-75
10-Ton, Long Stroke Ram	RC-161
10-Ton, Lock-On Tubing Set	FZ-14
Clamp Toe	Z-8
Plunger Toe	Z-9
Connector	Z-10
Flat Base	Z-14
90° "V" Base	Z-16
Ram Toe	Z-30
Solid Serrated Saddle	Z-34
Chain Pull Plate	Z-132
Chain (7'), with Grab-Hook	Z-141
Clamp Head	Z-192

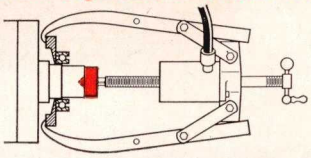




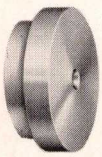
Adjusting Screw Accessories

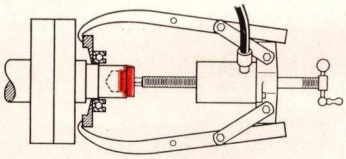
For use with all Hydraulic Push-Pullers and Grip-Pullers powered by 20, 30 and 60 ton Holl-O-Rams





SHAFT PROTECTORS: Fit between Adjusting Screw and solid shaft to preserve trueness of shaft center hole. Prevents it from being distorted or galled.





STEP-PLATE ADAPTORS: Give Adjusting Screw point of contact on tapped or hollow shafts or on solid shafts having no center hole. Also used for pressing bushings in or out.

ADJUSTING SCREW CONTACT SET—includes every Shaft Protector and Step-Plate Adaptor listed below fitting each Blackhawk Adjusting Screw contained in every Holl-O-Ram Push-Puller and Grip-Puller Set.

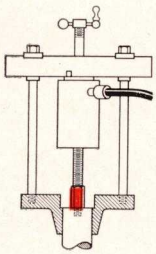
HP-227 ADJUSTING SCREW CONTACT SET CONTENTS LISTING

Shaft Protectors			Step-Plate Adaptors					
Part No.*	Stock dia.	Center Pt., 60°, Base dia.	Part No.*	Step dia.	Face dia.	Part No.*	Step dia.	Face dia.
HP-2702	1"	5/16"	HP-2605	1 1/4"	1 5/8"	HP-2612	2 1/8"	2 5/8"
HP-2701	1 1/4"	3/8"	HP-2606	1 3/8"	1 3/4"	HP-2613	2 1/4"	2 3/4"
HP-2700	1 1/2"	7/16"	HP-2607	1 1/2"	1 7/8"	HP-2614	2 3/8"	2 7/8"
			HP-2608	1 5/8"	2"	HP-2615	2 1/2"	3"
			HP-2609	1 3/4"	2 1/8"	HP-2616	2 3/4"	3 1/4"
			HP-2610	1 7/8"	2 3/8"	HP-2617	3"	3 1/2"
			HP-2611	2"	2 1/2"			

Any part may be ordered individually * One each per set

ADJUSTING SCREW PULL ADAPTORS enable user to attach Adjusting Screw to tapped shaft directly or through other Adaptors for pulling shafts or installing press-fit parts on shaft with Hydraulic Push-Pullers and Hydraulic Grip-Pullers.

ADJUSTING SCREW PUSH ADAPTORS fit Adjusting Screw of Hydraulic Push-Pullers and Hydraulic Grip-Pullers for pushing pins in or out.



ADJUSTING SCREW PUSH-PULL ADAPTOR SETS—contains select group of Push and Pull Adaptors that fit the Adjusting Screw used with Hydraulic Push-Pullers and Grip-Pullers . . . in all three tonnage capacities.

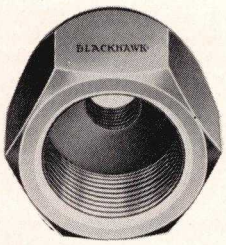
ADJUSTING SCREW ADAPTOR SETS AND CONTENTS LISTING

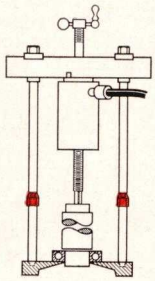
Set No.	HP-226				HP-326				HP-526			
Type	Part No.*	Fem.	Male	Lgth.	Part No.*	Fem.	Male	Lgth.	Part No.*	Fem.	Male	Lgth.
Pull	HP-2027	1"-8	5/8"-18	3"	HP-2330	1 1/4"-7	5/8"-18	4"	HP-2334	1 5/8"-5 1/2	1"-14	4"
	HP-2028		1"-14	3"	HP-2332		1"-14	4"	HP-2333		1"-8	4"
Push	HP-2029		1/2" shk.	4 3/4"	HP-3029		3/4" shk.	5 3/4"	HP-2338		1" shk.	6 1/4"
	HP-2032		3/4" shk.	4 7/8"	HP-3042		1" shk.	5 3/4"	HP-2339		1 1/4" shk.	6 1/4"

Any part may be ordered individually * One each per set

Push-Puller Attaching Accessories

For attaching all Hydraulic Push-Pullers powered by 20, 30 and 60 ton Holl-O-Rams to job set-ups





REDUCERS—Adapt Push-Puller Legs to studs of housing so as to attach Push-Puller to housing for pulling and installing operations.

FOR USE WITH 20-TON HOLL-O-RAM

HP-229 PUSH-PULLING ATTACHING SET AND SUB-SET CONTENTS LISTING

Push-Puller Leg Reducer Set No. 232 Contains

Part No.*	From	To	Lgth.
HP-2500	5/8"-18	1/2"-20	1 1/8"
HP-2501		5/8"-18	1 1/8"
HP-2502		3/4"-20	1 1/8"
HP-2031		3/4"-16	1 5/8"
HP-2503		13/16"-16	1 1/8"
HP-2506		7/8"-20	1 1/8"
HP-2505		7/8"-18	1 1/8"
HP-2504		7/8"-14	1 1/8"
HP-2507		1"-14	1 1/8"
HP-2508		1 1/8"-12	1 1/4"
HP-2510		1 1/4"-12	1 1/2"
HP-2514		1 1/4"-7	2 1/8"

Push-Puller Leg Reducer Set No. 232 (Cont.)

Part No.*	From	To	Lgth.
HP-2516	5/8"-18	1 1/2"-12	1 5/8"
HP-2518		1 1/2"-7	1 5/8"

Push-Puller Leg Adaptor Set No. 231 Contains

Part No.*	Female	Male	Lgth.
HP-2300	5/8"-18	1/4"-20	2 1/4"
HP-2301		5/16"-18	2 1/4"
HP-2304		3/8"-24	2 1/4"
HP-2305		3/8"-16	2 1/4"

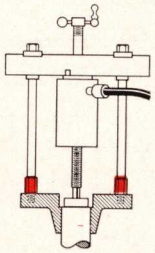
Push-Puller Leg Adaptor Set No. 231 (Cont.)

Part No.*	Female	Male	Lgth.
HP-2303	5/8"-18	7/16"-20	2 1/4"
HP-2302		7/16"-14	2 1/4"
HP-2306		1/2"-20	2 1/4"
HP-2307		1/2"-13	2 1/4"
HP-2308		9/16"-18	2 1/4"
HP-2309		5/8"-11	2 1/4"
HP-2310		3/4"-16	2 1/4"
HP-2311		3/4"-10	2 1/4"
HP-2312		7/8"-14	2 1/4"
HP-2313		7/8"-9	2 1/4"
HP-2314		1"-14	2 1/4"
HP-2315		1 1/8"-12	2 1/4"

Any part may be ordered individually * Two each per set

FOR USE WITH 30-TON HOLL-O-RAM

HP-329 PUSH-PULLING ATTACHING SET AND SUB-SET CONTENTS LISTING



ADAPTORS—Adapt Push-Puller Legs to tapped holes of housing so as to attach Push-Puller to housing for pulling and installing operations.

Push-Puller Leg Reducer Set No. 332 Contains

Part No.*	From	To	Lgth.
HP-2507	1"-14	5/8"-18	1 1/8"
HP-3041		1"-14	2"
HP-2509		1 1/8"-12	2"
HP-2512		1 1/4"-18	3"
HP-2511		1 1/4"-12	2 1/8"
HP-2515		1 1/4"-7	2 1/8"
HP-2520		1 1/2"-18	2 1/8"
HP-2517		1 1/2"-7	2 1/8"

Push-Puller Leg Reducer Set No. 332 (Cont.)

Part No.*	From	To	Lgth.
HP-2519	1"-14	1 1/2"-12	2 1/8"

Push Puller Leg Adaptor Set No. 331 Contains

Part No.*	Female	Male	Lgth.
HP-2321	1"-14	5/8"-18	3 3/16"
HP-2320		5/8"-11	2 1/2"

Push Puller Leg Adaptor Set No. 331 (Cont.)

Part No.*	Female	Male	Lgth.
HP-2322	1"-14	3/4"-16	2 1/2"
HP-2323		3/4"-10	2 1/2"
HP-2324		7/8"-14	2 3/4"
HP-2325		7/8"-9	2 3/4"
HP-2326		1"-8	2 3/4"
HP-2327		1 1/8"-12	2 3/4"
HP-2331		1 1/4"-7	3"
HP-2340		1 3/4"-12	3"

Any part may be ordered individually * Two each per set

FOR USE WITH 60-TON HOLL-O-RAM

HP-529 PUSH-PULLING ATTACHING SET AND CONTENTS LISTING

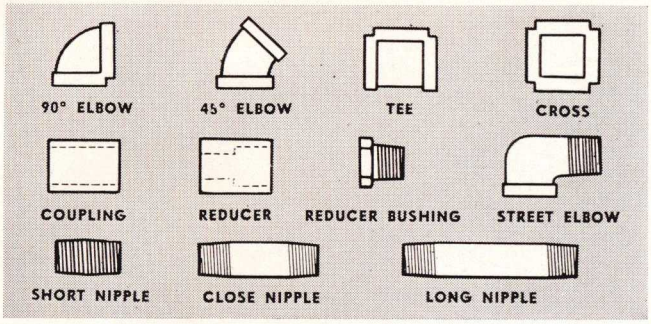
REDUCER				ADAPTOR				ADAPTOR			
Part No.*	From	To	Lgth.	Part No.*	Female	Male	Lgth.	Part No.*	Female	Male	Lgth.
HP-2513	1 1/4"-12	1 1/4"-12	3"	HP-2328	1 1/4"-12	1"-14	4 1/2"	HP-2329	1 1/4"-12	1 3/4"-12	4 3/4"

Any part may be ordered individually * Two each per set

GAUGE - VALVES FITTINGS - HOSES - OIL

HOLL-O-RAM ACCESSORIES

FITTINGS



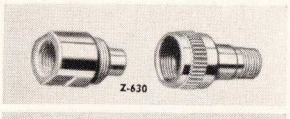
Blackhawk high pressure steel fittings are job engineered to withstand vibrations—minimize friction losses—insure high sealing qualities. Readily adaptable for installations where tubing is more practical than hose.

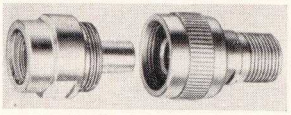
BLACKHAWK HYDRAULIC HIGH-PRESSURE FORGED STEEL FITTINGS

National Pipe Thread Size	1/4"	3/8"	1/2"
Description	Nos.	Nos.	Nos.
90° Elbow	FZ-1601	FZ-1610	FZ-1620
45°	FZ-1602	FZ-1611	FZ-1621
Tee	FZ-1603	FZ-1612	FZ-1622
Cross	FZ-1604	FZ-1613	FZ-1623
Coupling	FZ-1605	FZ-1614	FZ-1623
Street Elbow	FZ-1606	FZ-1616	FZ-1626
Close Nipple, length	FZ-1607, 7/8"	FZ-1617, 1"	FZ-1627, 1 1/8"
Short Nipple, length	FZ-1608, 1 1/2"	FZ-1618, 1 1/2"	FZ-1628, 1 1/2"
Long Nipple, length	FZ-1609, 2"	FZ-1619, 2"	FZ-1629, 2"
Reducer	1/4" to 3/8" FZ-1615		—
	—	3/8" to 1/2" FZ-1625	
Reducer Bushing	1/4" to 3/8" FZ-1630		—
Cold drawn steel tubing. Recommended Size	17/32" O.D. x 11 ga. (.120")	21/32" O.D. x 11 ga. (.120")	27/32" O.D. x 5/32" wall

SPEE-D-COUPLERS

Standard use to connect and disconnect Hose to Holl-O-Rams. Also can be used to connect and disconnect Pump and Hose. Allows quick interchange of Hydraulic Unit components in only a few seconds. Z-630 acts as swivel between Holl-O-Ram Gauge and Gauge Adaptor.





Z-604

SPEE-D-COUPLER COMPONENTS

Spee-D-Coupler	Z-630	Z-604
Includes:		
Hose End (male)	ZH-630	ZH-604
Ram End (female)	ZR-630	ZR-400
Cap (Ram end closure)	Z-640	Z-410
All threads NPT	1/4"	3/8"

HOSE

Used to transfer oil under high pressure from pump reservoir to rams. Of superior reinforced construction to control successive expansion and contraction of hose length under full pressure and to withstand sudden surges of pressure.

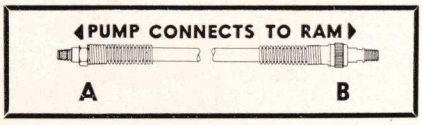
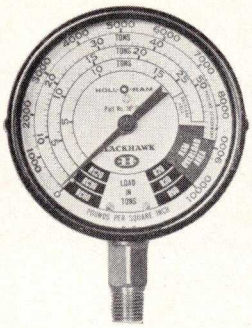


TABLE OF AVAILABLE HOSE

Hose No.	Length	A	B
Z-913	6 feet	3/8" male pipe	ZH-604
Z-914	6 feet	3/8" male pipe	Z-604
Z-916	2 feet	3/8" male pipe	ZR-400
Z-927	10 feet	3/8" male pipe	ZH-604
Z-668	6 feet	ZR-400	ZH-604

HOLL-O-RAM SAFETY GAUGE



HP-2345

Insures safe operation of Holl-O-Rams and Hydraulic Pullers by recording exact load capacities on an easy-to-read, color-coded dial face. Gauge can be set in convenient viewing position by threading directly into Gauge Adaptor, or can be swivel connected by coupling them together with Z-630 Spee-D-Coupler. One Gauge serves all three Holl-O-Rams of 20, 30 and 60 ton capacities.

- **DIAL**—3½" dia., Indicates pressure (psi), load in tons, ram and puller overload areas. Crystal is non-breakable.
- **CASE**—Drawn steel, phosphatized for rust resistance. Finish is oven-baked black enamel.
- **CONSTRUCTION**—Monel metal, Rotary Type movement—steel bourdon tube—rugged and durable with slotted link to protect pointer on sudden pressure release.
- **CONNECTION**—Forged Brass with ½" wrench flats—¼" Male Pipe Thread with restricted orifice in connection, reducing pointer quiver.
- **ZERO SET UP**—with no pressure applied, pointer rests against stop on the dial for retaining accuracy of gauge during possible rough handling. The *first* ton graduation on any of the load scales does not show. The *first* graduation on the pressure scale is 125 p.s.i. and all the remaining graduations on that scale are 250 p.s.i.

NOTE: Holl-O-Ram Hydraulic Units and Pullers having set numbers suffixed -G are equipped with Gauge No. HP-2345.

HP-2344

HOLL-O-RAM GAUGE ADAPTOR

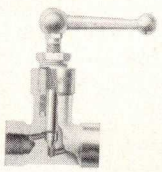
Used to connect gauge in line, preferably between pump and hose.

PUMP END—3/8" NPT (Male)
HOSE END—3/8" NPT (Female)
GAUGE TAP—1/4" NPT (Female)

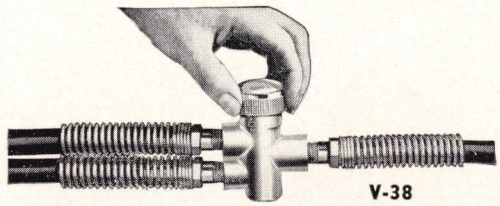
VALVES

V-38 Remote Control—for control of motor driven pump from a distance. Complete valve and hose assemly available as SC-4 (includes two Z-914 and one Z-913 hose).

V-8 Shut-Off—provides positive shut-off. 10,000 p.s.i. capacity. Can be used between pump and each hose or tube connecting to ram for powering several rams simultaneously, but independent of each other. 3/8" NPT in each port.



V-8



V-38

BLACKHAWK HYDRAULIC OIL

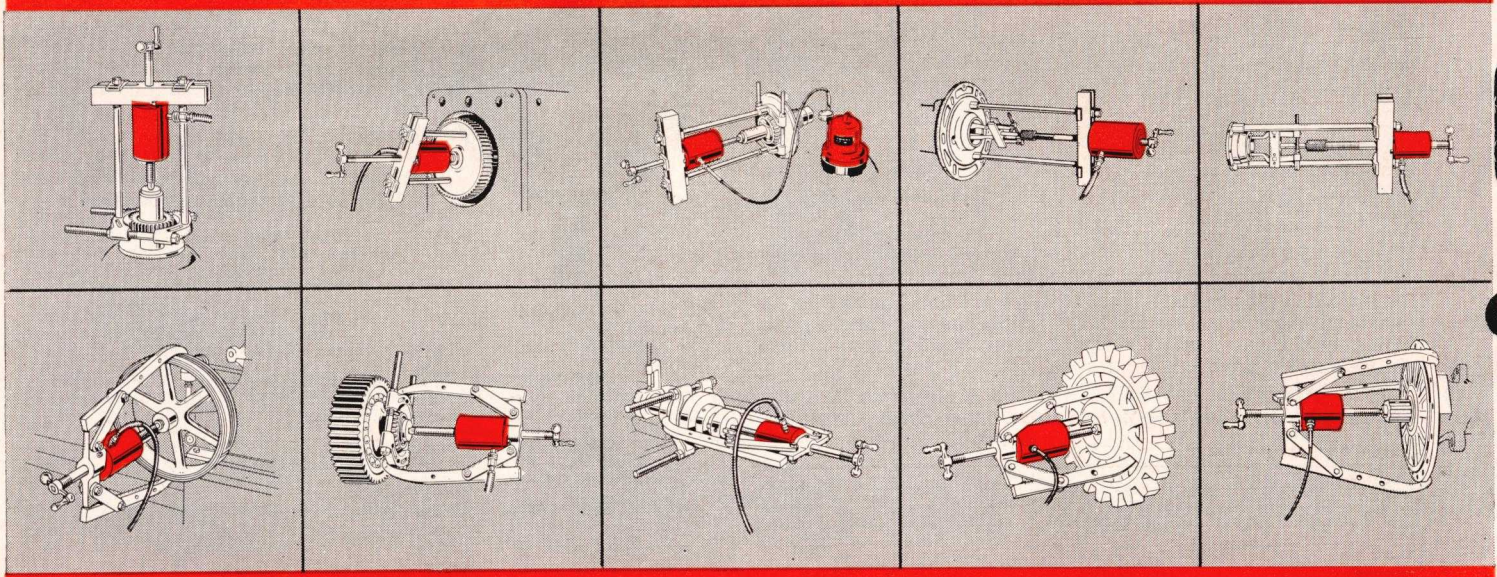
LX-21—FOR HAND OPERATED PUMPS
Contains these important additives: Rust Preventers, Lubricity Improvers, Sludge Stoppers to prolong oil life and protect your valuable Hydraulic Units. Keep on hand.

LX-22—FOR ELECTRICALLY-DRIVEN PUMPS
Special foam-resistant oil with high lubricating qualities, necessary for the high speeds and pressures generated by these pumps. Run more smoothly, efficiently and coolly.

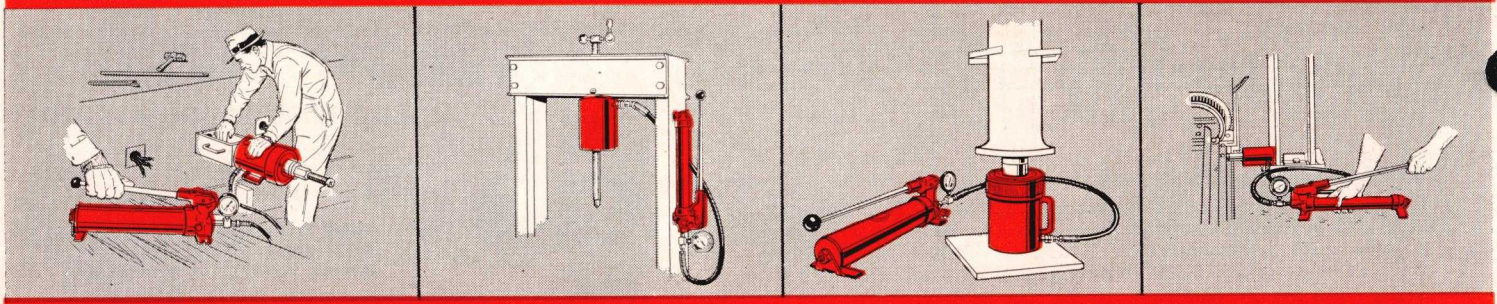
NEW BLACKHAWK HOLL-O-RAMS

present advanced methods of transmitting tremendous hydraulic force for . . .

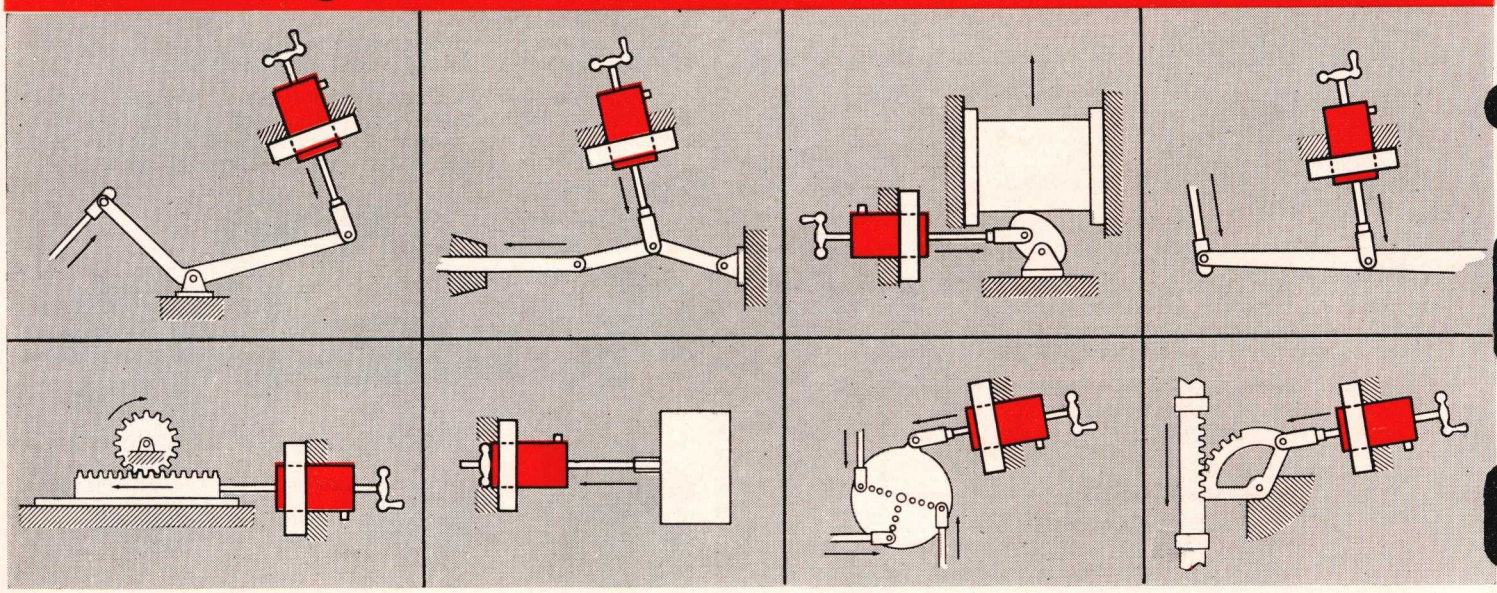
● Activating New Hydraulic Pullers for Maintenance



● Solving Hundreds of Problems in Production, Construction



● Motivating Mechanical Movements for Jig and Fixture Applications



BLACKHAWK

BLACKHAWK MFG. CO.
MILWAUKEE, WIS.

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